June 1934

RAILWAY TRACK and STRUCTURES

This Issue . . .

FORMERLY
Railway Engineering and Maintenance

ON TIME! CHECK IT!

Tight schedules require dependable track...

joint bolts stay tighter longer with RELIANCE

HY-CROME
spring washers

RAILROADS DEPEND on perfection in many details to keep the trains running on time. Not the least of these is keeping track joints tight. Reliance spring washers are designed to do this job and do it well. Control of development and research, manufacture and servicing by experienced personnel help produce and distribute a Hy-Crome product that has been privileged to serve the American Railroads for many years. Their confidence is appreciated.

To those roads we do not serve, we would like the opportunity to send one of our railway fastening engineers to give you more details. Write today.

"Edgemark of Quality"

EATON MANUFACTURING COMPANY, RELIANCE DIVISION

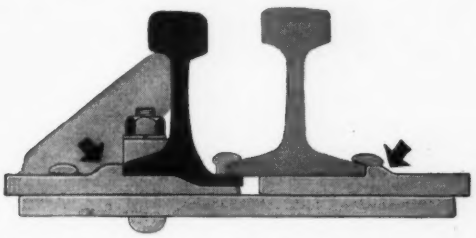
OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

Why this guard rail won't spread ...won't overturn

Here is a guard rail that really stands pat. No shock or side thrust will spread it or make it turn over.

Why won't it spread? A glance at the cross-section sketch gives the answer. The rolled-steel tie plate has a shoulder which abuts the base of the guard rail; a shoulder on the other side of the plate then locks the guard rail in position.



Why won't it overturn? Again check the sketch. Notice the special section of the guard rail, with rolled flange fitting under the running rail. When a train passes over, its rolling weight holds the guard rail down in a vise-like grip. Braces welded to the base plate further add to the stability of the guard rail. The flare on the ends of the guard rail guides the wheels safely into line even at main line speeds.

Heat-treated, high-tensile steel bolts, fitted with lock nuts, hold the guard rail to the tie plates. Foot guards are riveted in place. The whole assembly is shipped as one piece, ready for installation without special tools or adzing of ties. If you want more details about the Hook-Flange Guard Rail, a Bethlehem man will be glad to call and take you to a nearby installation for first-hand inspection.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

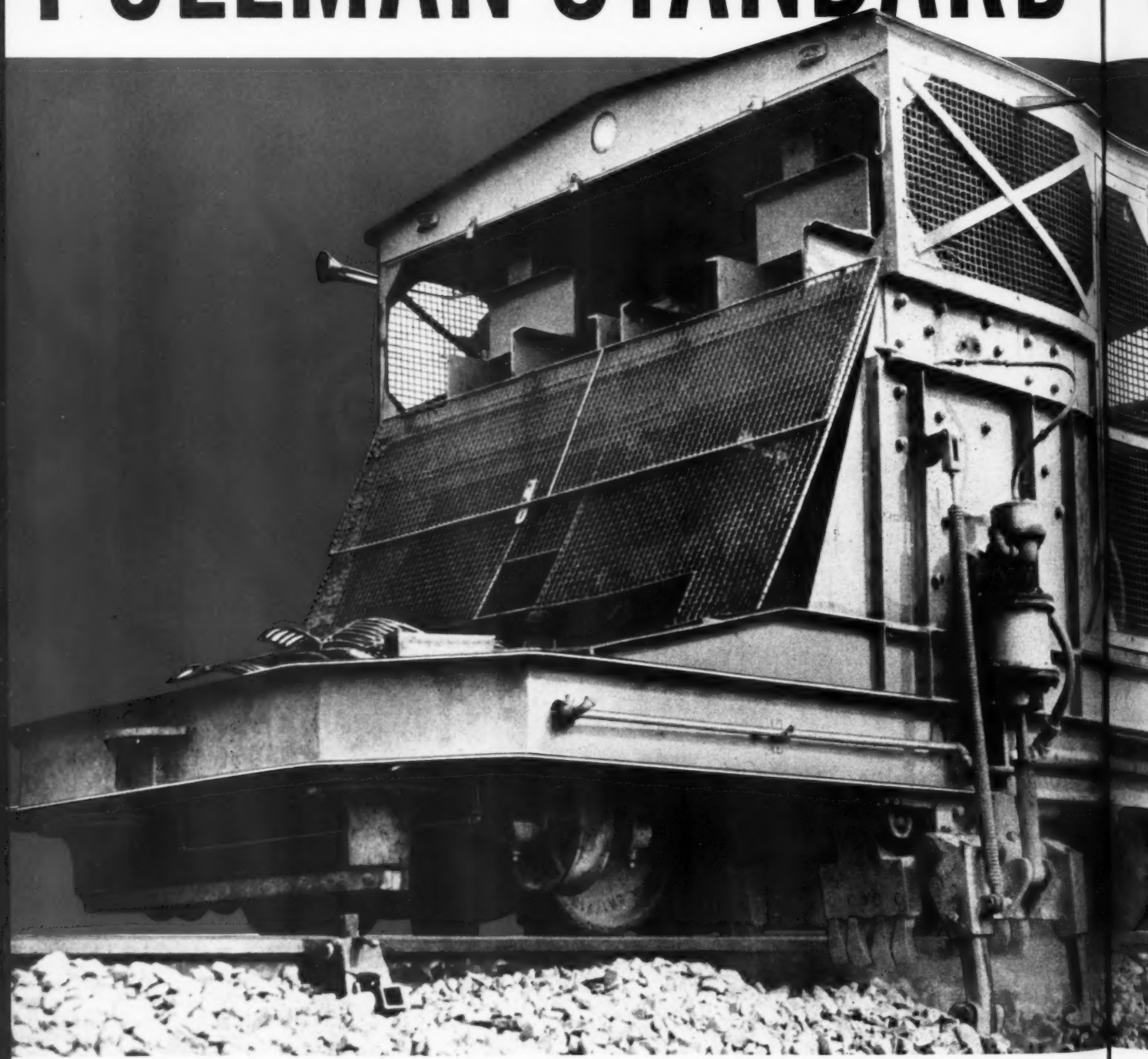
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOOK-FLANGE GUARD RAIL

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $1.50; $2.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 50, No. 6.

PULLMAN-STANDARD

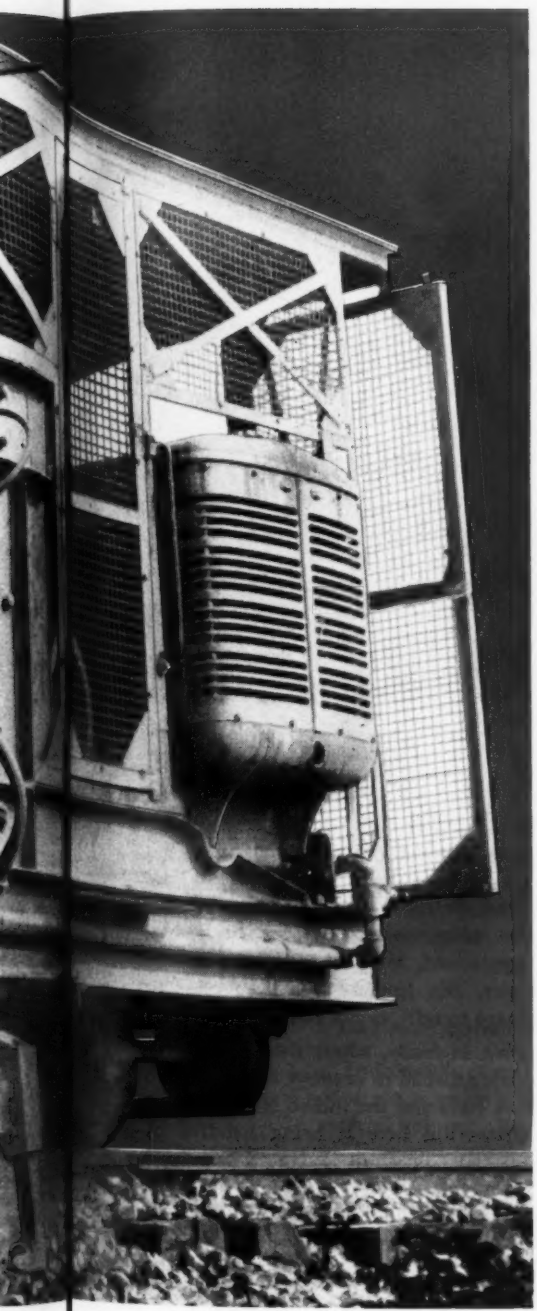


Power Ballaster—With a production rate of 500 to 700 feet an hour, a Pullman-Standard Power Ballaster run by a single operator, can be efficiently manned by a crew of 10 to 15 men. Case history studies made on 16 railroads prove that this unit will give more feet of finished tamped track per hour, with less labor and maintenance, than any other production tamper.

Power Cleaner and Winch Car Team—Both track shoulders can be cleaned simultaneously at 1000 to 1200 feet per hour with only four men. Even in multiple track territory, cleaning to eight to ten inches below the tie base is at this high rate and low labor complement. Your ballast cleaning costs can be reduced by as much as 50%.

Power Cribber—The Pullman-Standard Power Track Cribber gives you two to three cribs a minute, with a single operator. With a normal production rate of 150 to 400 track-feet per hour, its interchangeable 4-, 5-, and 6-inch digger tips enable it to crib efficiently and economically in any type of ballast, regardless of cementation.

POWER BALLASTER



- tamps 500 to 700 feet per hour
- efficiently manned by 10 to 15-man crew
- low maintenance requirements
- has triple-action compaction
- proved in service on 30 railroads

If you are interested in better, faster, lower cost mechanized track maintenance, get *all* of the facts about Pullman-Standard Track Equipment. Then compare, feature for feature with any other. Write or phone the Pullman-Standard office located nearest to you.

YOUR NEEDS CREATE THE PULLMAN "STANDARD"

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

79 EAST ADAMS STREET, CHICAGO 3, ILLINOIS

BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

96 yds. HOURLY

with off-track Tournapull

speeds railroad construction

in  Sicily

Power-proportioning differential automatically transfers up to 4 times more power to wheel on firmest footing. Big low-pressure tires provide ample traction, flotation for hauling through rain-soaked material.

On railroads the world over, D Tournapulls are speeding both major construction and right-of-way maintenance. With their short 12'8" turn radius, these "one-man work crews" are ideal for work in restricted quarters. The units self-load for small yardage maintenance assignments. They can be pusher-loaded on production operations, and are easily loaded by shovel, dragline or hopper. Big low-pressure tires cross or follow tracks without damage to rails, ties or switches.

A typical example is shown in Sicily, where the Government of Italy is building a 20-mile railroad to improve transportation between the seaport city of Gela and the inland trading center of Caltagirone. All earthmoving here is being handled by Mario and George Franchetti Bros. of Rome. Their 2 D Tournapulls are helping move 740,000 cubic yards of earth to level hills, fill valleys, and build bridge approaches. Each of these high-speed units loads, hauls and spreads 48 cubic yards of sandy clay per hour over hauls which average 3300 ft. one-way. They have worked steadily for a year, despite rains from November to March which made the clay very sticky, and hot dry weather from April to October which made it extremely hard.

Performance earns repeat order

"We are so pleased with these first 2 units," says Partner George Franchetti, "that we have decided to confirm our order for a third."

"The Tournapulls have performed very well and have given me the greatest satisfaction," says Foreman Eugenio Petronari. "These machines are producing economically the many cubic yards I demand daily from our operators and equipment."

Self-loading 6 cubic yards of wet clay containing a small amount of sand and gravel takes about one minute. When push-loaded with 70 hp crawler-tractor, Tournapull load time is reduced to 35 seconds.

Operator Maganuco Salvatore agrees. "I have been operating many different types of equipment," he says, "but this is the first machine that has produced as many cubic yards per day as the foreman has requested. Tournapull is easy to operate and easy to maintain. It does not tire me out. It keeps me interested in the job."

One-man dirtmovers

Each of these 7-yd. Tournapulls can work as a one-man earth-moving crew. They drive anywhere via road or right-of-way at speeds to 28 mph. They dig, haul, and spread material without interference from rail traffic. Push-loading in groups of 2 or more they become production tools for construction projects. Ask us for job reports on American Railroads.

Operator handles scraper functions and steering with simple, fingertip electric switches. Control system is so simple that men can be trained to become good operators in a few hours.

Tournatractor—Trademark Tournapull—Trademark Reg. U.S. Pat. Off. DP-413-RR

LeTourneau-Westinghouse Company

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A Subsidiary of Westinghouse Air Brake Company

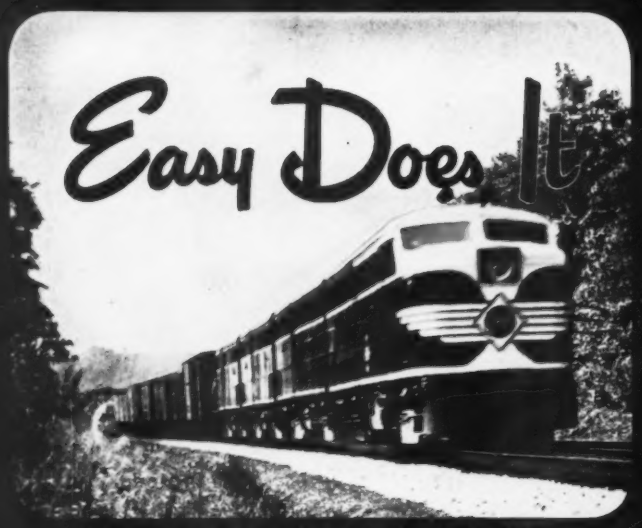
Send now to: LeTOURNEAU-WESTINGHOUSE COMPANY, Peoria, Illinois

Tell us more about: 7-yd., 122 hp D Tournapull ☐ Interchangeable 9-ton rear-dump ☐ Rubber-tired Tournatractor ☐

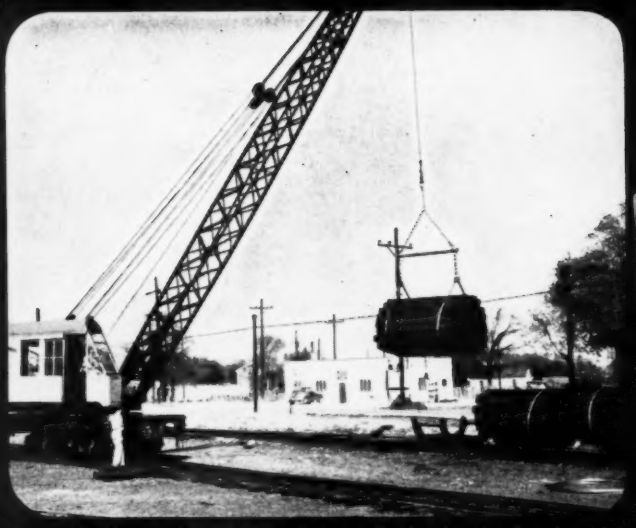
Name..... Title.....

Railroad..... Division.....

Address..... City..... State.....



"Rising costs challenge the railroads—the backbone of America's transportation."



"to keep the traffic moving calls for hundreds of crossties per mile"

"it's an easy job for the crane operator to load 6- and 7-ton loads of ties"

"one road distributed 10,000 ties using a crew of 4 men and a foreman"

SEE BRAINARD STEEL'S NEW MOVIE!

The story of mechanized tie handling

BRAINARD STEEL'S new motion picture presents *mechanized* tie handling—which has produced cost savings up to 30% on many major railroads. Now you can easily see all the details of mechanized tie handling in action, in full color and sound.

Write today to request a showing for your engineering and track maintenance personnel. Film also available for loan without charge for association and technical meetings. Write Brainard Steel Division, Dept. S-6, Griswold Street, Warren, Ohio.

Brainard

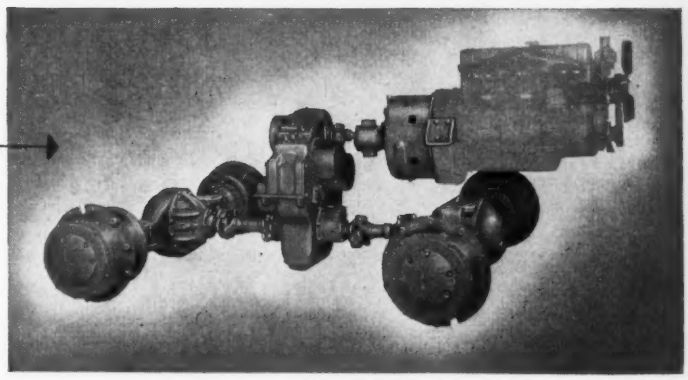
SHARONSTEEL

STEEL DIVISION

SHARON STEEL CORPORATION

Here's Why The **MICHIGAN** *Tractor Shovel*
WILL DO MORE WORK FOR YOU!

* *This Power Train — from engine to tires — engineered and manufactured by Clark*



* **CLARK TORQUE CONVERTER** — 3-to-1 multiplication factor provides maximum torque *when it is needed.* Precise control in inching and digging.

* **CLARK POWER-SHIFT TRANSMISSION** —no conventional clutch; four speeds forward and reverse—direction control by lever on the steering column.

* **CLARK PLANETARY DRIVE AXLE** — final reduction in the wheel reduces the torque load on all gears and shafts.

RESULT — easier operation, utmost accessibility and simplicity of servicing, highest efficiency in shovel handling.

ADD greater weight and more horsepower than any front-end loaders of comparable capacity, and you see why you can Move More with a MICHIGAN*.

*A Trademark of Clark Equipment Company

For full information send for the MICHIGAN Tractor Shovel Fact-Folio —specifications, action photos, magazine article. The coupon will bring your copy.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY, Construction Machinery Division
492 Second Street, Benton Harbor, Michigan, U. S. A.

Please send the MICHIGAN Tractor-Shovel Fact-Folio

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Address_____

City_____ Zone_____ State_____

HERE'S HOW YOU SAVE WITH

JACKSON MULTIPLES

MORE FINISHED TRACK PER DAY

In any lift, from that which is no lower than the average size of ballast used to the very highest, no tamper equals the ability of the Jackson Multiple to put up high quality finished track.

OF GREATER UNIFORMITY

In the majority of cases no follow-up operation, whatever, is required. It's the only on-track tamper that tamps the "vital spot" — the load-bearing zone directly beneath the rail.

WITHOUT DAMAGE TO TIES OR BALLAST

The unique and powerful vibratory action of the Multiple's tamping blades thoroughly keys and consolidates the ballast particles without breakage and absolutely no damage to ties. Roadbeds thus achieved last longer, require less maintenance.

AT MUCH LOWER INVESTMENT COST

The Jackson Multiple costs far less than any machine that can be considered comparable.

AND EXCEEDINGLY LOW MECHANICAL UPKEEP

Rugged and reliable, maintenance of the machine is extraordinarily simple and inexpensive, and much of it is readily done in the field.

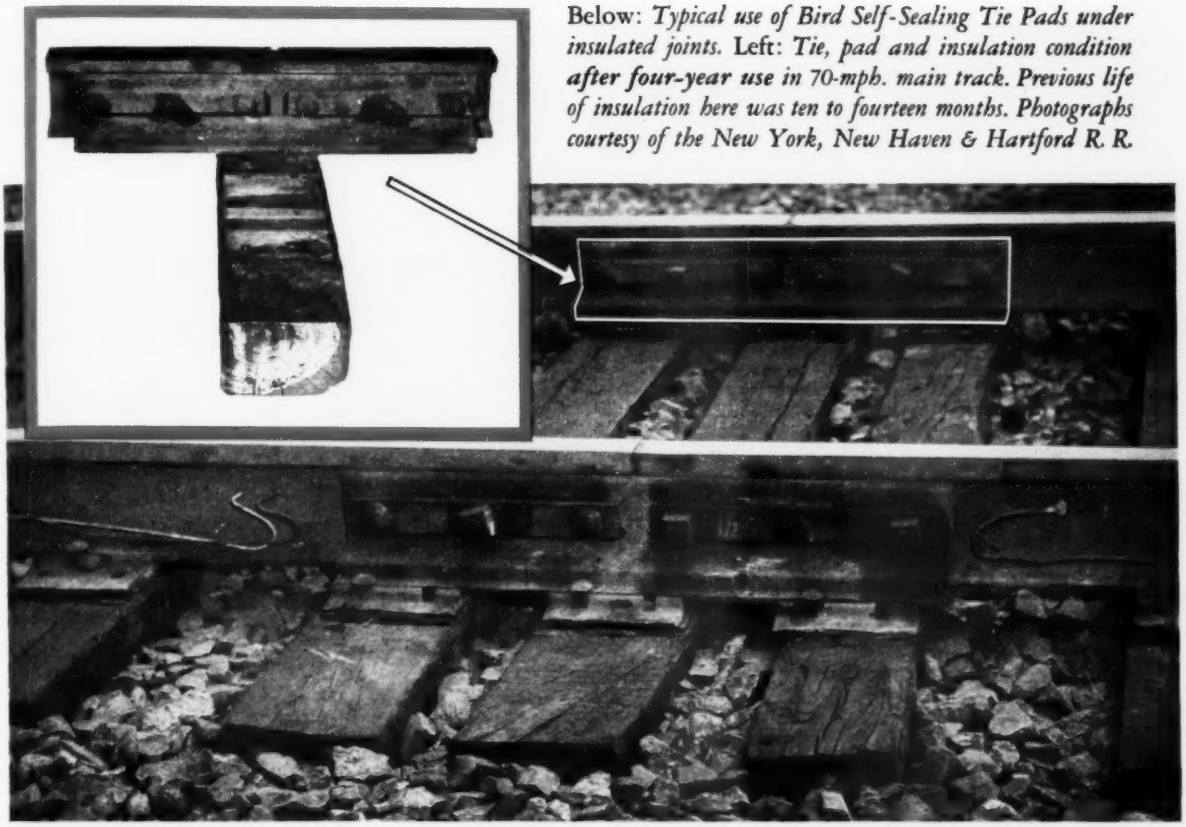
Put a Jackson Multiple on your own track on our attractive Rental-Purchase Plan and prove these facts to your own satisfaction.

MFD. BY JACKSON VIBRATORS INC. LUDINGTON, MICH

SOLD IN U.S.A. BY

ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON MICHIGAN



Below: *Typical use of Bird Self-Sealing Tie Pads under insulated joints.* Left: *Tie, pad and insulation condition after four-year use in 70-mph. main track. Previous life of insulation here was ten to fourteen months. Photographs courtesy of the New York, New Haven & Hartford R. R.*

Slash your joint insulation costs 75% with BIRD Self-Sealing TIE PADS

BIRD SELF-SEALING TIE PADS maintain proper support for insulated joints by eliminating mechanical wear and plate penetration. These pads form a waterproof, dustproof seal on the tie that protects the vulnerable area under the tie plates and around the spikes.

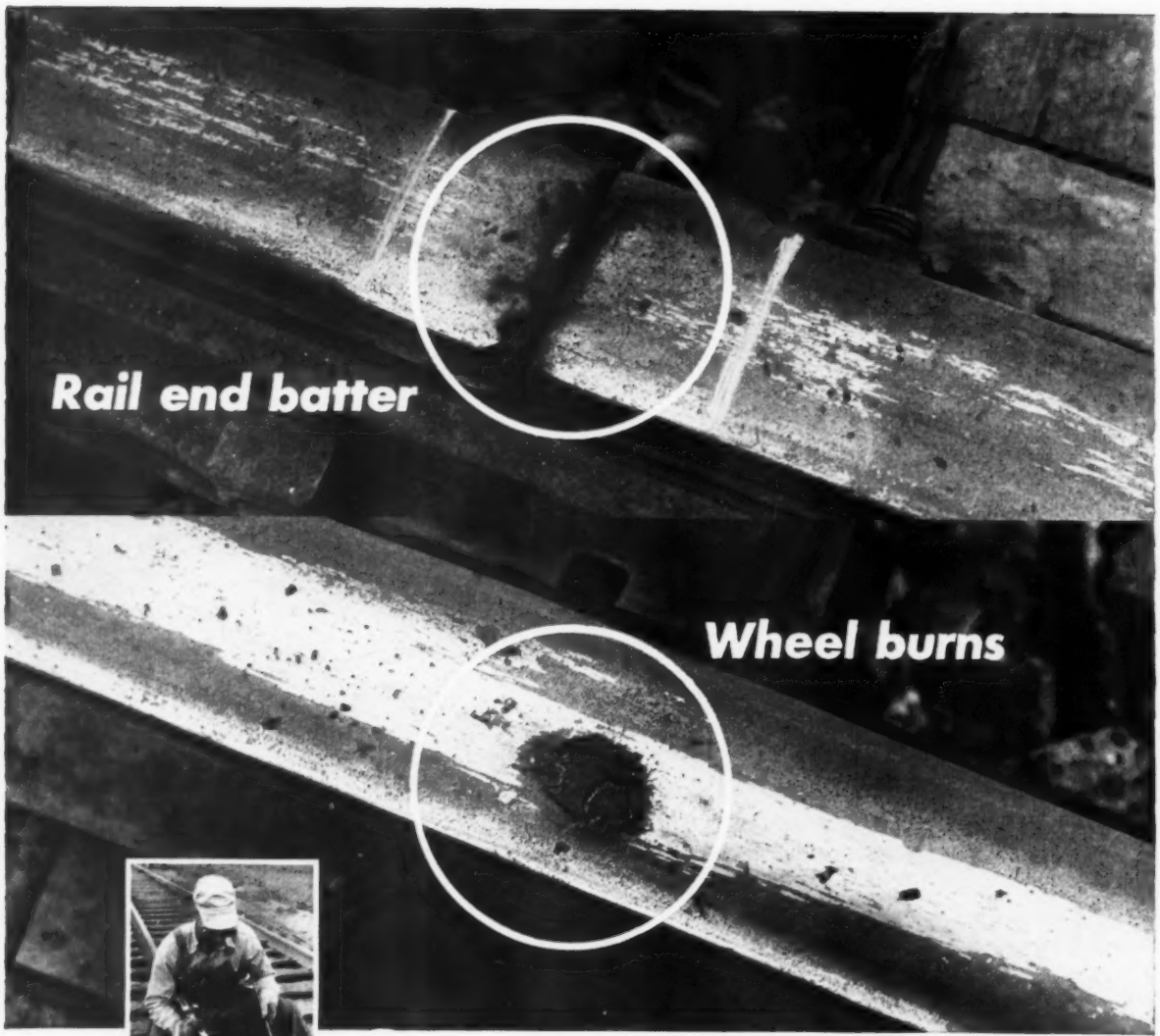
YOU GET BIG RESULTS—HERE'S PROOF! Study the results in the insulated joints pictured here after four years of heavy wear in 70-mph. main track.

- The insulation is intact and shows no sign of distress. Since previous life of insulation in this joint was ten to fourteen months, insulation costs were cut more than 75%.
- In addition, the BIRD pads kept the supporting ties free of mechanical wear.
- Also, the vulnerable underplate and spike hole areas are still sealed off from all moisture and abrasion.
- Previous surfacing of this joint was necessary three to four times per year In this installation with Bird pads, no surfacing was required for the entire four-year period, thus saving *all* surfacing costs on this joint during that time. For best results, pad the shoulder as well as the joint ties.
- The BIRD pads themselves are still in excellent condition showing no wear. The beading around the edges of the tie pads shows proper pad performance.

BIRD PROVEN BEST! The only self-sealing tie proven by years of in-track experience.

Write today for more information to BIRD Tie Pads, Dept. HTS-6, East Walpole, Mass.

BUY THE BEST BIRD & SON inc. Established 1795 **BUY BIRD**



one rod for both

Airco Railroad Rod provides a single answer to these two common types of rail damage. You can use it to build up battered and chipped rail ends, or, by a simple adjustment of the welding torch's oxyacetylene flame, to fill in and smooth out rail burns. Hardness of the deposit is 251 to 350 Brinell—well within the required range for both applications. Airco Railroad Rod is standard on many major railroads, not only because it eases stocking problems but also because of the high quality of its deposit.

Your Airco railroad representative will be glad to arrange an actual demonstration. Why not get in touch with him today?

AIRCO®

OFFICES IN
MOST PRINCIPAL CITIES

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60 East 42nd Street • New York 17, N. Y.

Air Reduction Sales Co. • Air Reduction Magnolia Co. • Air Reduction Pacific Co.
Represented Internationally by Airco Company International

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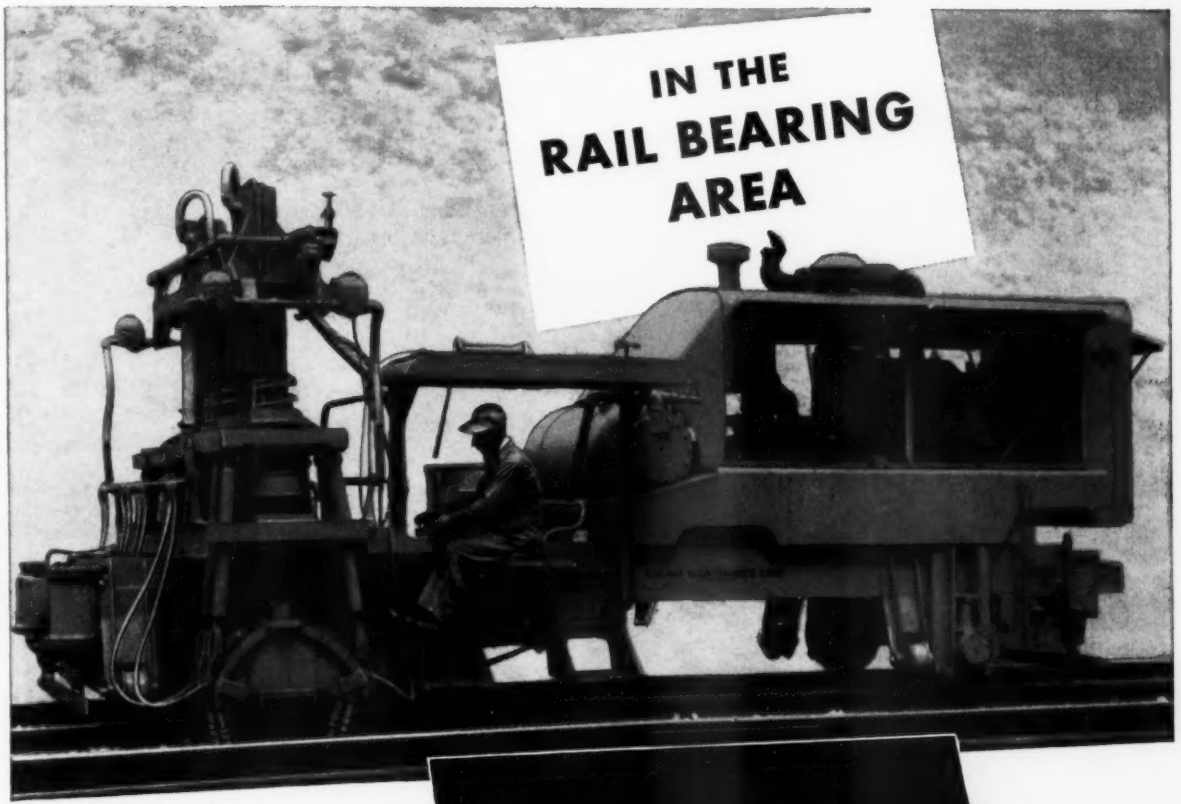
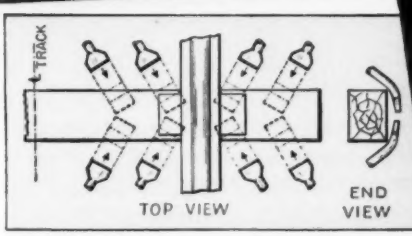
at the frontiers of progress you'll find

AN AIR REDUCTION PRODUCT

MAXIMUM COMPACTION





All tamping tools are mounted at an angle of 30° towards the rail. Tamping action forces the tools under the tie, assuring maximum compaction in the rail bearing area under the tie.

McWilliams TIE TAMPER

Typical five day operation (24 ties per rail, 2½" stone, 4" to 5" raise) showed average speed of 585' per hour, with speeds up to 620' per hour. McWilliams Air Tie Tamper is particularly efficient on low raises and spot surfacing. Ability to tamp under each rail individually, a great advantage in spot surfacing and picking up low joints.

Railway Maintenance Corporation

PITTSBURGH 30, PA.

DESIGNERS AND MANUFACTURERS OF: McWILLIAMS MOLE AND SUPER MOLE . . . McWILLIAMS TIE TAMPER, CRIB CLEANER AND BALLAST DISTRIBUTOR . . . R. M. C. TIEMASTER

If FASTER COMPLETION cuts costs...

For huge industrial projects like this, or for the smallest of jobs, Monotube piles meet every engineering requirement while saving time and dollars.

Monotube Foundation Piles

look how MONOTUBE PILES can help!

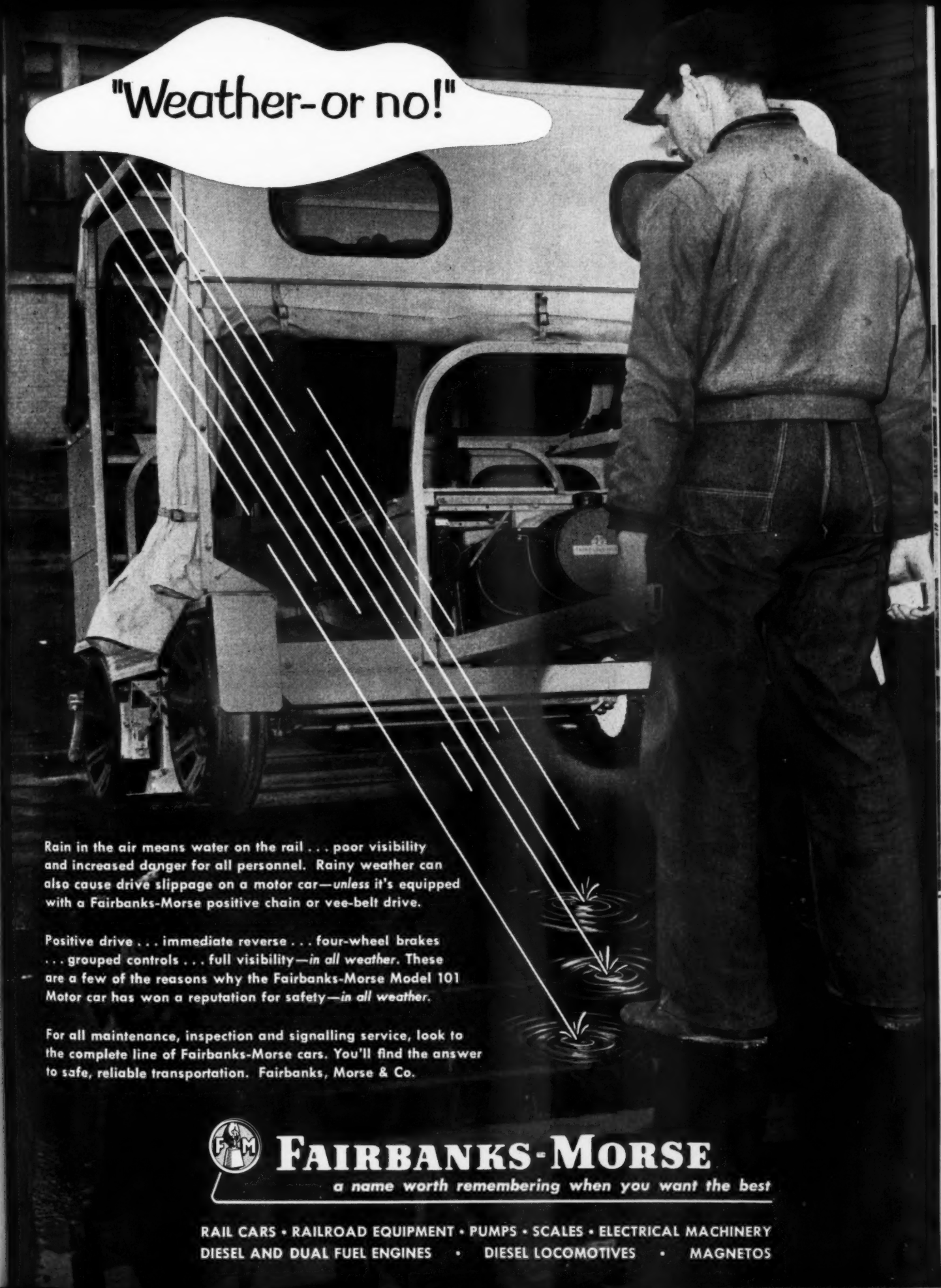
1. LIGHT WEIGHT. Much faster driving due to reduced inertia. No need for a core or mandrel. More piles driven per rig per shift!

2. SIMPLIFIED PROCEDURE. Light standard cranes suffice. They move in quickly. Setup and moving time is cut. Over-all time and costs are reduced.

3. EXTENDIBILITY. Quickly, easily weld-spliced to *any* length, on the spot, using standard extensions or cutoffs. Because of light weight, high strength and easy handling, field welding goes *fast.* No difficult welding operations.

Here are just a few of the cost-important reasons why more and more jobs are getting off to a good start with Monotube piles. Get *all* the facts. Write to The Union Metal Manufacturing Co., Canton 5, Ohio, for Catalog No. 81.

UNION METAL



Rain in the air means water on the rail . . . poor visibility and increased danger for all personnel. Rainy weather can also cause drive slippage on a motor car—*unless* it's equipped with a Fairbanks-Morse positive chain or vee-belt drive.

Positive drive . . . immediate reverse . . . four-wheel brakes . . . grouped controls . . . full visibility—*in all weather*. These are a few of the reasons why the Fairbanks-Morse Model 101 Motor car has won a reputation for safety—*in all weather*.

For all maintenance, inspection and signalling service, look to the complete line of Fairbanks-Morse cars. You'll find the answer to safe, reliable transportation. Fairbanks, Morse & Co.

FAIRBANKS-MORSE

a name worth remembering when you want the best

RAIL CARS • RAILROAD EQUIPMENT • PUMPS • SCALES • ELECTRICAL MACHINERY
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • MAGNETOS

NEWS NOTES...

...a resumé of current events throughout the railroad world

JUNE, 1954

A Presidential Emergency board has recommended $150 million's worth of welfare, vacation and holiday benefits for the nation's one million non-operating employees. The board's recommendations are as follows: (1) Medical, hospital and surgical care insurance which would be paid for by the workers and carriers, jointly, and covering the employee but not his family; (2) an extra week of vacation for employees who have 15 or more years of service; and (3) provision that a worker receive his regular weekly compensation when he works a short week because of a holiday, and, if he is required to work on a holiday, compensation at the rate of time-and-one-half for that day in addition to his regular pay. The board rejected the demands for double-time extra pay for holidays, for extra Sunday pay, for a minimum $3,500 employer-paid life insurance plan and free railroad transportation for employees and families. At the time of going to press neither industry nor the unions had made any comment as to whether the recommendations would be acceptable to them.

•

The wage dispute between the Switchmen's Union of North America and 12 western railroads and terminal companies has been settled. Basis for the settlement was the so-called "trainmen package" previously accepted by the BRT, the Conductors and the Firemen and Enginemen. The final agreement is for a five cents an hour increase plus 13 cents an hour previously gained under cost-of-living adjustments. The settlement also calls for extension of vacations from two to three weeks and for termination of the cost-of-living escalator provision.

•

Brotherhood of Locomotive Engineers' demands for a 22½ per cent wage increase have met with stiff opposition from the carriers before a six-man arbitration board in Chicago. "No justification exists" for granting engineers "favored and preferred" wage treatment over other operating employees, the board was told by carrier representatives. Carriers are urging the board to deny the wage request, and in its place extend the pattern of settlement already agreed to by other operating organizations.

•

The Brotherhood of Railroad Trainmen has given its whole-hearted support to the New York Central's decision to build terminals in five major cities for trailer-on-flat-car operation. By thus meeting "the transportation challenge of our times," says the BRT, the NYC "will benefit the railroad, our customers, shippers, and railroad workers who will loyally assist in making the operation a success." To accentuate its support the BRT now has a specially designed news release form publicizing T-O-F-C service.

•

Fifteen Eastern, 19 Western and two Canadian railroads have announced bargain fares for family travel in Pullman and parlor cars, until recently available only for coach travel.

NEWS NOTES (continued)

Reduced roundtrip coach fares inaugurated by the Pennsylvania have received favorable public response, according to Fred Carpi, vice president —traffic. "It is evident," says Mr. Carpi, "that low cost, coupled with frequency, convenience, comfort, and safety of train service is beginning to attract a response among travelers."

•

"Rail lcl traffic is not nearly so poor in quality as some would have you believe," according to George O. Griffith, director of traffic, American Home Products Corporation, and "highway service leaves much to be desired in many respects."

•

The Pullman-Standard Car Manufacturing Company has unveiled a scale model of a new, all-purpose flat car which is described as usable in all types of "piggyback" operations, yet is equally suitable for general freight service because it has a completely flat deck.

•

Annual savings of approximately $100 million have been reported by the Association of American Railroads as a result of 55 specific research projects carried on by that organization on behalf of the railroad industry. The projects covered in the survey deal with mechanical equipment, roadway construction and maintenance, and freight loss and damage prevention.

•

Plans to convert the entire street-level floor of the Chicago & North Western's passenger terminal at Chicago into a shopping center have been disclosed by Paul E. Feucht, president. The shopping center will be made possible by the relocation and improvement of other facilities in the terminal. In addition to the creation of a shopping center, the program calls for installation of escalators, construction of new ticket offices and other facilities on the second floor as well as enlargement of the second-floor area where all passenger service facilities will be located. Construction on the first two stages of the project was begun last month, with the third stage to be undertaken next year.

•

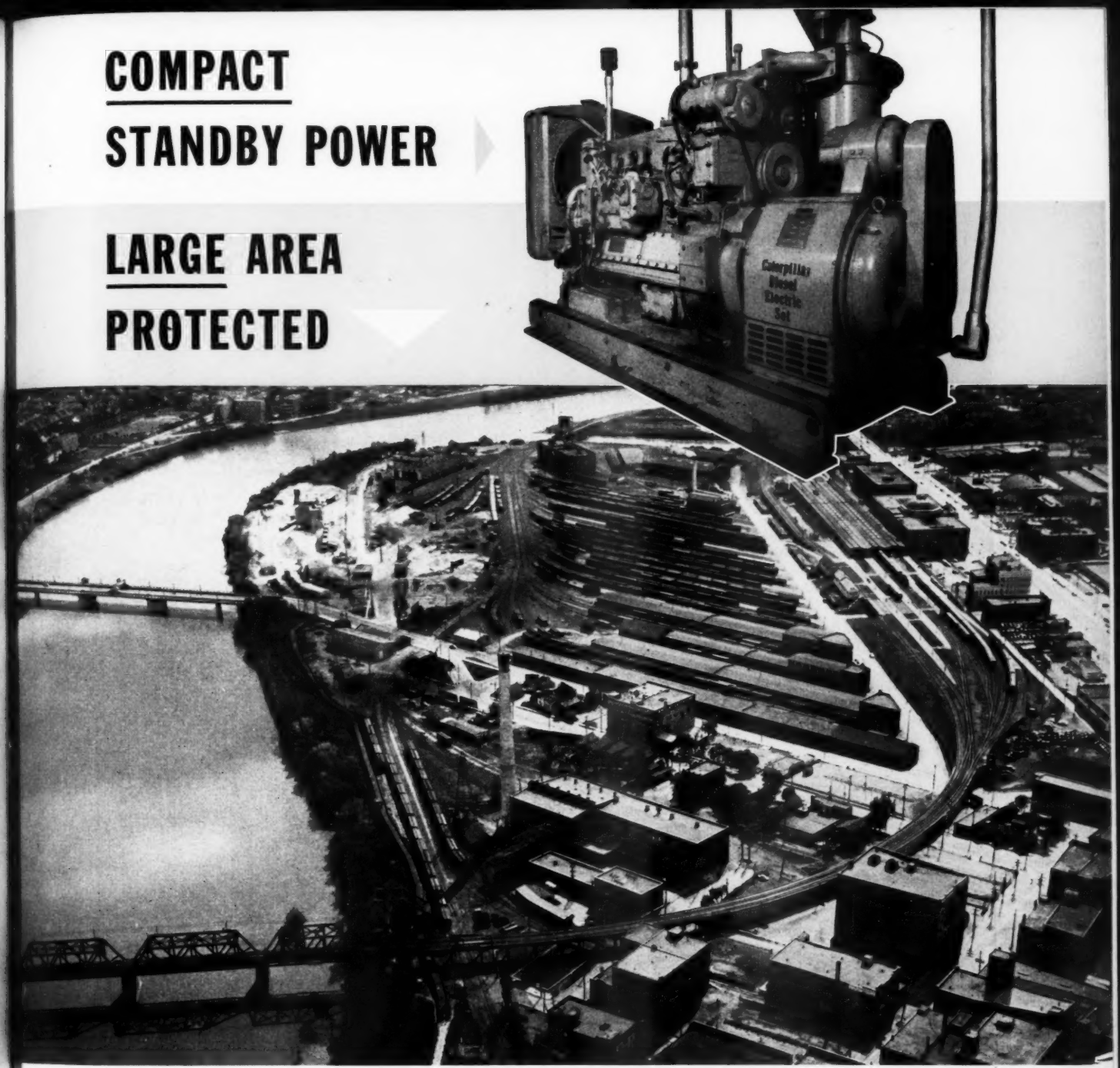
The Canadian National is planning two new branch lines to tap mine areas in northern Ontario and northern Quebec. One line will run from St. Felician, Que., to Chibougamau and on to Beattyville, about 281 miles. The other is to run from Hillsport, Ont. to Manitouwadge Lake, about 25 miles. Estimated cost is $38,750,000.

•

ALSO WORTH NOTING—The "California Zephyr" has been operating with an average load factor of 90 per cent for the past five years . . . The Senate has sent its time lag bill back to the Committee on Interstate and Foreign Commerce for further study . . . The AAR has acquired a million pound machine, formerly owned and used by the Pennsylvania, for "squeeze testing" passenger cars . . . The Order of Railway Conductors has changed its name to the Order of Railway Conductors and Brakemen . . . Travel last year by regularly scheduled domestic air lines was nearly four times more hazardous than travel by rail.

COMPACT STANDBY POWER

LARGE AREA PROTECTED



For emergency electric power in its Winnipeg yards, Canadian National Railways depends on a Caterpillar D318 Electric Set.

The compact standby unit is installed in the railway's steam generating plant in the city yards. It stands ready to supply instant power to coal conveyors, forced and induced draft fans, stoker motors, boiler pumps and emergency lights.

With a dependable, self-regulated Caterpillar Electric Set, you can forget the troubles a power failure could cause. These sets can be started by manual, remote, and completely automatic systems. Cat Electric Sets can be started, reach operating speed and take over the load — all in a matter of a few seconds.

And you get this dependability at minimum cost. All Cat® Electric Sets — there are 12 sizes up to 315 KW — operate on low-cost No. 2 furnace oil without fouling, even when idling. They need very little space. They are easy to install — no concrete foundation is necessary.

And the operation of these self-regulating units is so simple that they require neither complicated switch gear nor a trained electrician.

Here is a power sentry that guards your operations *and* your costs. Your Caterpillar Dealer, an expert on power plants, is ready to prove the benefits of Cat Electric Sets. Have him show you the model that exactly fits your needs!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR®

CAT POWER MEANS DEPENDABLE POWER

1 **Lengthen crosstie life**—By cushioning the tremendous shock of impact, eliminating tie abrasion and cutting action, the Burkart Tie Pad is successfully proving to be the most effective, most economical prolonger of crosstie life on the market today. Combining the toughest available structural fibre and a tough, abrasion- and shear-resistant high density binder, fused under great pressure, into a dense, rugged mat, the Burkart Tie Pad permanently protects the tie against destruction under the tie plate.

Strong and resilient, the Burkart Tie Pad constantly maintains full bearing strength and density, does not become brittle in severest cold, does not flow in extreme heat, seals against grit, resists moisture and preserves the vital tie area from fungus, brine, weed sprays, oil, vermin, etc., commonly found along the right-of-way.

Why M/W Engineers are choosing Burkart Tie Pads

2 **Forestall Secondary Track Problems**—Rail end batter, spike loosening, regauging and reballasting are materially reduced by the Burkart Tie Pad. Its grasping action prevents shifting of the pad, and spikes hold. Joint bars remain tight. Its shock-absorbing resiliency protects against destructive movement, "rail wave" and drifting of ballast.

3 **Reduce Maintenance and Replacement Cost**—Labor costs money—when you invest in Burkart Tie Pads, you save on labor and materials involved in *replacement* of ties; *resetting* of spikes; *tightening* of joint bars; tie *tamping* and *regauging*. These are substantial, traceable dividends that will show up in black ink on *your* railroad's Financial Statement.

SEE FOR YOURSELF how rugged Burkart Tie Pads can save you money. Test them at trouble spots on your railroad—on bridge ties and at switches and curves, even on your straightaways. Send for sample, prices or additional information. If you wish, an experienced Burkart technical representative will gladly consult with you.

F. BURKART MFG. CO., Railroad Tie Pad Division
Division of Textron, Inc.
4900 North 2nd Street • St. Louis 7, Mo.

THE BURKART TIE PAD
with or without adhesive

NOW a Gradall designed for every railroad's maintenance needs!

NEW RAILROAD GRADALL Designed especially for railroads for on-track as well as off-track maintenance. Has oversize, track-climbing tires and power steering. Works over *every mile* of your right-of-way. Eliminates need for work train. Extra-heavy frame and axles, plus 6 x 6 drive, provide rigidity and power for work anywhere. Available with remote control of undercarriage.

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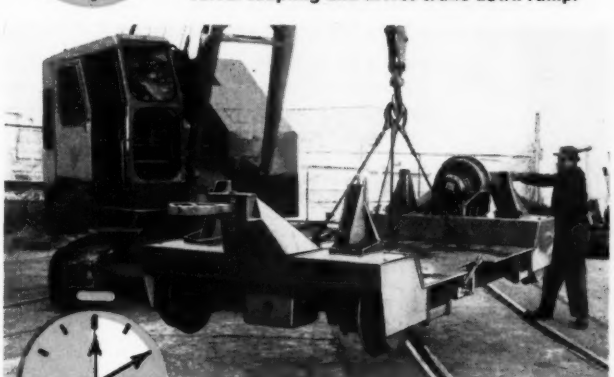

Crane lifts its propulsion car off the track . . . clears the right-of-way for uninterrupted rail traffic. Entire loading or unloading operation takes less than 10 minutes!

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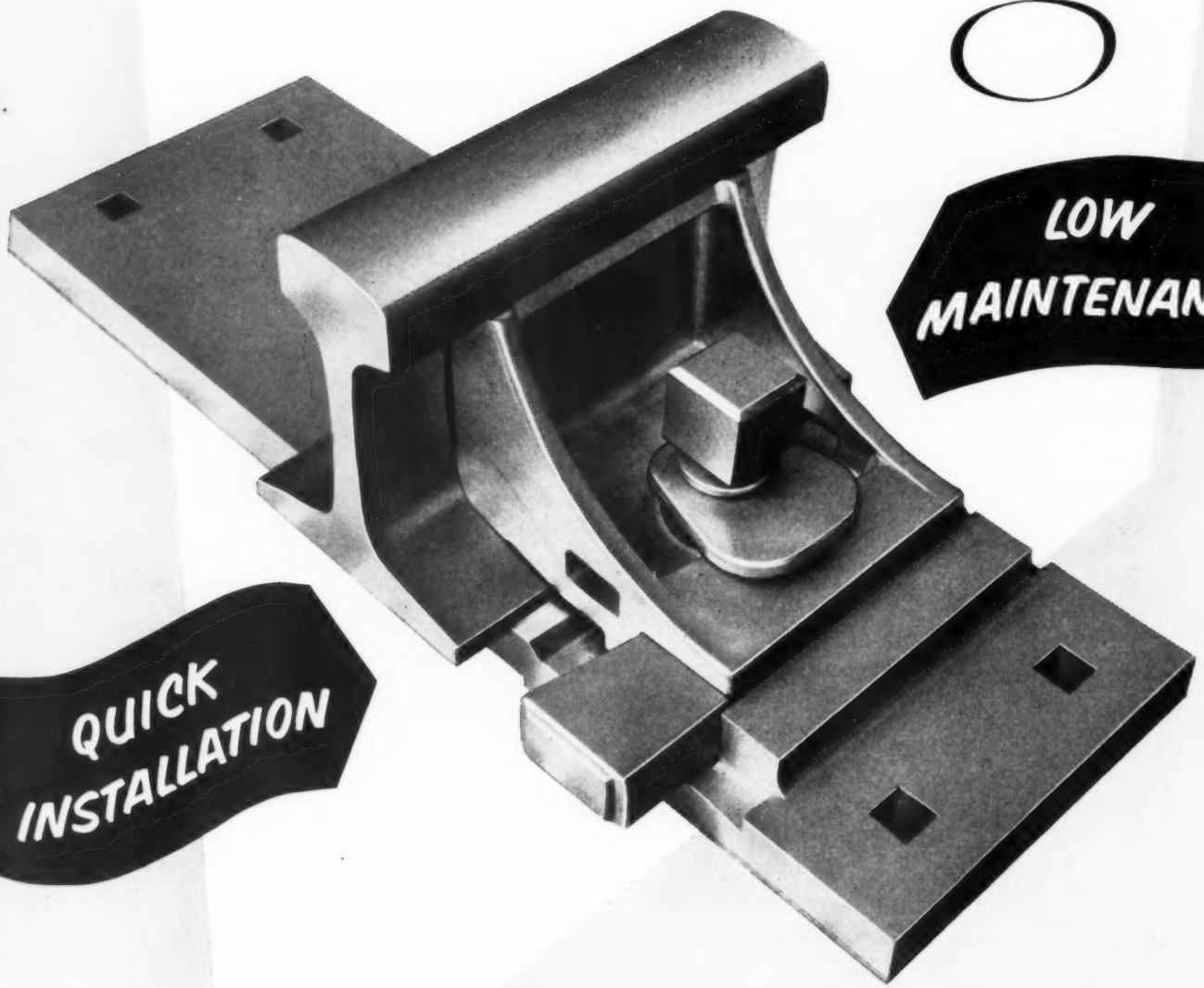
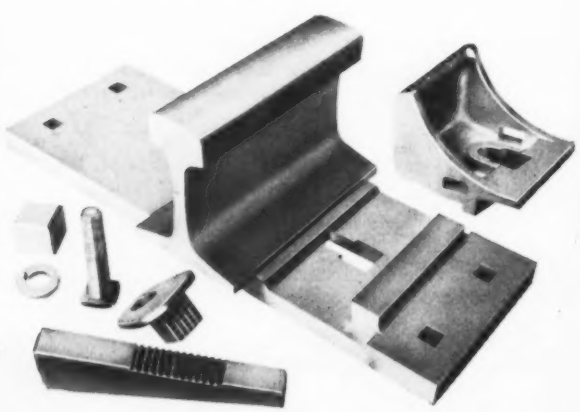
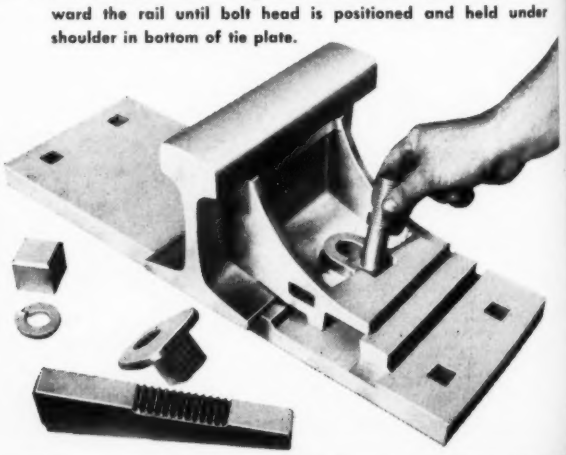


QUICK INSTALLATION

1. Assembly takes place after the rail is seated on the plate and plate has been spiked to the tie.



2. Brace is snugly fitted into the fishing of the stock rail. Bolt is then inserted from the top with the head down, moved in toward the rail until bolt head is positioned and held under shoulder in bottom of tie plate.



The New, Self-locking USS Taylor Adjustable Rail Brace

THE new Taylor Adjustable Rail Brace offers advantages found in no other rail brace. Combining the simplicity of good design with rugged construction, it insures sturdy rail support – takes the repeated side thrusts of heavy, fast traffic without loosening, thus maintaining track gage and alignment.

Installation is quick. Rail, tie and plate need not be disturbed. And once installed, the USS Taylor Adjustable Rail Brace is *locked* in position. Even if the cap nut becomes loosened, the locking plate with its serrations interlocking those of the wedge will continue to hold the wedge in the proper position. The bolt serves merely as an anchor for the locking plate plug, while the cap nut and shielded locking plate protect the bolt threads against corrosion.

Maintenance on this type of brace is rarely necessary

The efficient design of the Taylor Adjustable Rail Brace results in less wear, a minimum of adjustment and longer service life. When adjustment is required (due to wear), the locking plate plug is simply lifted and the wedge tapped in with a hammer.

For further information, write to United States Steel Corporation, 525 William Penn Place, Room 4396, Pittsburgh 30, Pennsylvania.

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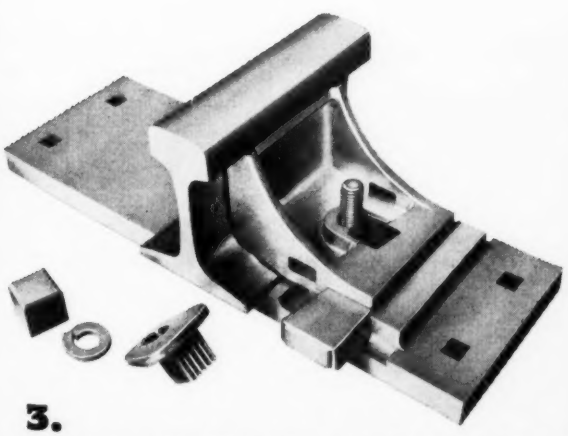
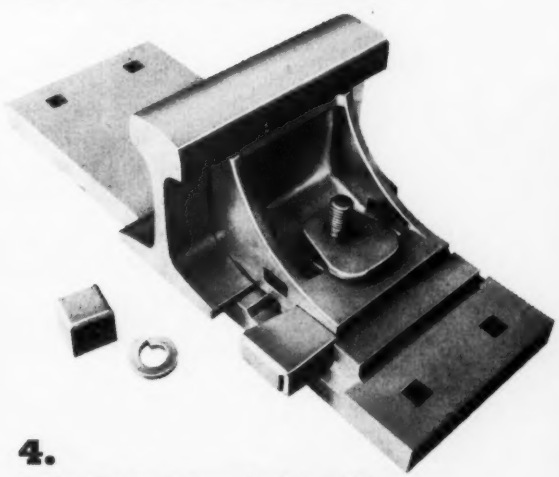
USS TRACKWORK



3.
Wedge is then driven tight with its serrations facing the rail. Opposite side of wedge is inclined to fit the undercut face of the stop block.



4.
Locking plate plug is dropped on bolt and into hole in brace. Serrations on outer face of plug engage those of the wedge, while inner smooth face of plug engages the vertical shoulders of the brace. Spring washer is then placed on bolt, and cap nut is applied and tightened.

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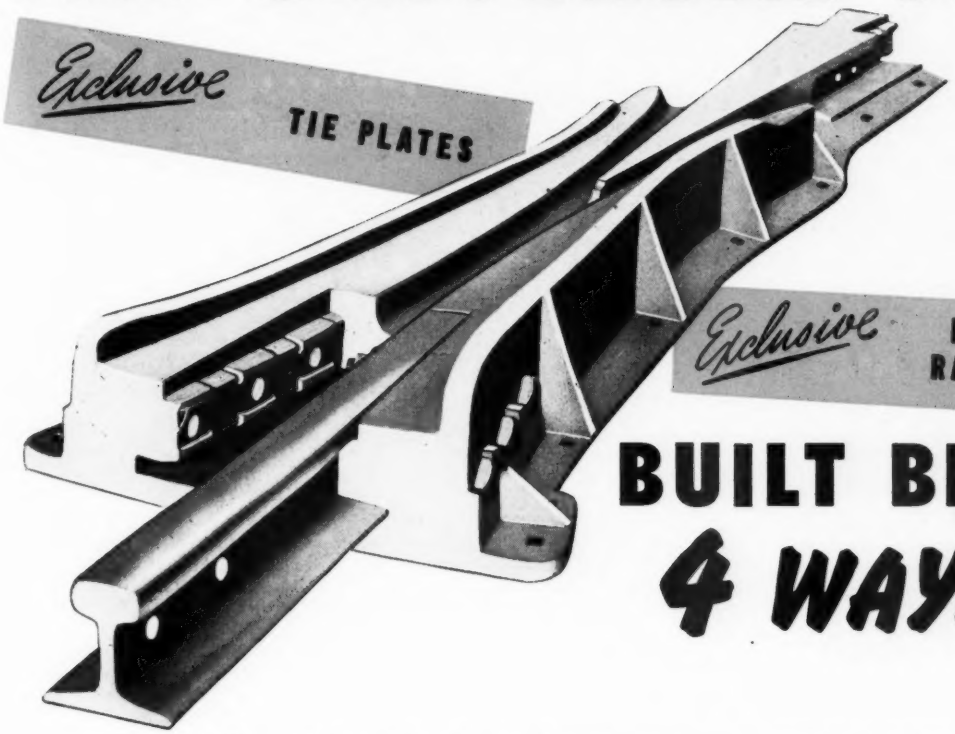
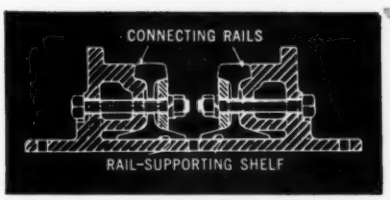
UNITED STATES STEEL

THE UNIVERSAL FROG



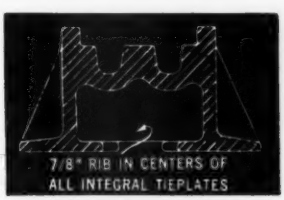
BUILT BETTER 4 WAYS...

1. It is made of an alloy electric cast steel that adapts itself to low-cost electric or oxy-acetylene welding either in track or shop.
2. Tie plates are cast integral with the Universal Frog.
3. Rail supports are cast integral on both ends of Universal Frogs.
4. This one-piece construction gives you greater rigidity — no loose joints! You eliminate many extra parts and cut down on labor costs for maintenance crews.



HERE'S THE PROOF!

Compare the cross sections above with conventional type built-up frogs. Note the improved type connecting rail joint, patented supporting shelf, integral tie plates and rib construction.



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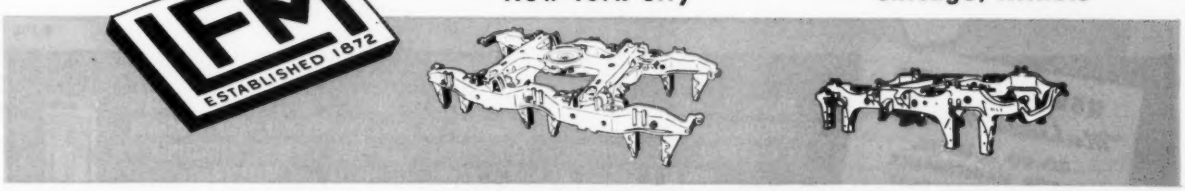

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Handling rail from cars to ties in foreground in a program for 112 miles of yard track by the Pennsylvania Railroad at Conway, Pa.

You don't need *new* steel to produce cost-cutting continuous rail. In 1952, 30 per cent of the welds made with RIBBONRAIL service were in secondhand rails.

HERE'S WHY...

Used rail lasts longer when it becomes continuous rail—no ends to batter, no joints to wear—practically eliminates maintenance.

Cropping battered ends eliminates need for re-conditioning used rail and bars.

Cropping battered ends prepares the rail for welding and cropped rail ends bring high scrap prices.

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These are strong points in favor of a RIBBONRAIL service program for used rail on your railroad.

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TWO INTERNATIONAL TD-14A crawler tractors with matched scrapers restore embankment near Thrall, Texas, following replacement of old rails with new 115-pound rails.

INTERNATIONAL crawlers used by Missouri Pacific Railroad on widespread improvement program

Playing a big part in the Missouri Pacific's planned progress are INTERNATIONAL crawler tractors with matched dozers and scrapers.

Hundreds of off-track jobs are being completed daily with speed and economy. And when it comes to ease of operation, listen to what dozer operator C. J. Miller has to say:

"I like the way this TD-14A handles, whipping around a telephone pole or holding a steady line just inches away from the railroad tracks. In this work you have to be able to look where you're going and go where you look. You've really got it made with a TD-14A."

Seven powerful models of reliable INTERNATIONAL crawler tractors with matched equipment are ready to do the job faster and better for you. And now the high-speed INTERNATIONAL two-wheel, rubber-tired tractors with scrapers round out the complete earth-moving line that comes in the Big INTERNATIONAL Package.

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For every move in Earthmoving

ON TRACKS ...ON RUBBER

See INTERNATIONAL'S "Job-Phased*" equipment

No. 306 of a series

RAILWAY TRACK and STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET
CHICAGO 3, ILL.

June 1, 1954

Subject: How It's Done

Dear Readers:

Every month, year after year, we bring to you a magazine full of articles and other features on subjects that we judge to be of interest to you. Where does it all come from? How are ideas for articles originated? How are the articles developed? Perhaps some of these questions, and others, have occurred to you. Perhaps not. But anyway, since the subject is of such importance to me, I thought you might be interested in knowing some of the answers.

The different ways in which articles on subjects of interest in our field can be, and are, originated are almost infinite in number. A small portion of the articles published come easy; that is, once in a while we receive in the mail the manuscript for an article that seems to meet all our requirements. When this happens, it is the answer to an editor's dream. The trouble is, it happens so seldom. More often than otherwise ideas for articles are originated only after patient prying into the business affairs of our readers. In our contacts with you, we are forever asking, "what's new?" -- and I wonder occasionally if some of you don't get a little tired hearing this question. I hope not, because it must be asked if we are to keep abreast of developments in the field.

Only in this way can we ferret out those developments which we believe will be of interest to you. That is the basic criterion to be satisfied before a development or a subject can be considered suitable article material. Once we have decided to prepare a particular article, the more common practice is to assign a staff editor to do the job, although, depending on conditions, we may endeavor occasionally to obtain the material on a contributed basis.

At this point our task has only begun. The problem then is to develop the story for you in the most interesting, attractive and concise manner. We must determine what is to be emphasized, how the article is to be organized, what illustrations are necessary and how it is to be presented. The making of these decisions frequently requires seemingly endless staff discussions, sometimes heated, but always constructive in that they help us to crystallize our thinking and thereby simplify the actual work of preparing the article.

Even after the article is written, we are still not over the hump. It is edited with careful attention to all the factors that we feel must be given consideration in preparing suitable "copy", and is sometimes even rewritten, in whole or in part, if the first draft is found to have basic shortcomings.

My primary objective here is to bring out the fact that material for this magazine is selected and developed with painstaking care. Our hope is, of course, that this objective on our part is reflected in the appearance and content of the magazine.

Yours sincerely,

Merwin H. Dick

Editor

MHD:lw

Members: Audit Bureau of Circulations and Associated Business Publications

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RAILWAY **TRACK and STRUCTURES**

TRADEMARK

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VOL. 50, NO. 6 **JUNE, 1954**

PUT YOUR LOADING IN LINE FOR SAVINGS

with an ATHEY MobiLoader

With the Athey MobiLoader, you can boost your loading production 40% and cut tractor maintenance costs by 50%. Here's how the MobiLoader can put your road ahead in time and money:

The MobiLoader works in a straight line! The rugged bucket is crowded into stockpiled or in-place materials by the geared-to-the-ground traction of a Caterpillar D4 Tractor. A heaped cubic yard is loaded with minimum effort. The bucket is raised as the tractor backs to the dump site. The bucket raises high and dumps its load to the rear. Average cycle time for load, haul, dump and return over a 30-foot haul is only 25 seconds.

The in-line loading eliminates turns, lost motion and operator fatigue. Track and clutch wear is reduced to the absolute minimum.

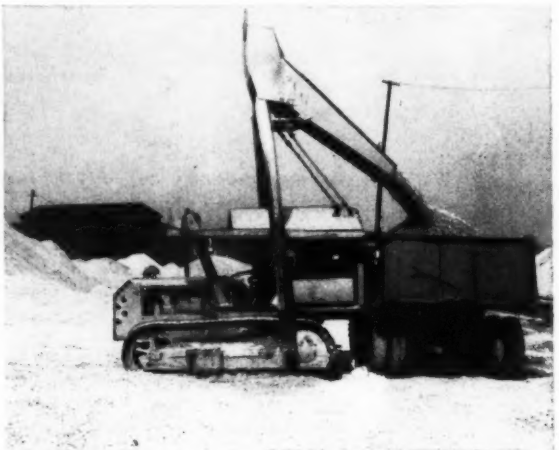
The MobiLoader is controlled hydraulically. Action is smooth, fast and powerful, with no gears or transmissions to use power. The Cat Diesel has unexcelled lugging ability to keep loads, production moving.

The MobiLoader has a wide variety of railroad applications. The husky loader has been used to handle right-of-way maintenance, yard work, and cargo shifts. Few loaders, if any, have been able to equal the productive records of the MobiLoader on these railroad operations.

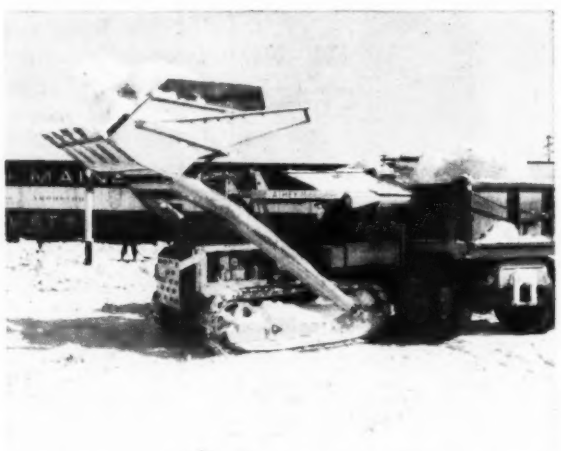
The Athey MobiLoader is sold and serviced by your Athey-Caterpillar Dealer. He can provide complete specifications, production capacities and cost data without obligation. Call on him or write direct to

ATHEY PRODUCTS CORPORATION
5631 West 65th Street, Chicago 38, Illinois.

This ML4 MobiLoader loads 80 to 100 tons of stockpiled nitrate each hour for the Louisville & Nashville Railroad in Pensacola, Florida. The same machine is used in summer months for maintenance-of-way.



Working in ballast material, this MobiLoader crowds in a one-yard load, treads 15 feet to dump overhead into a high-bodied hauler.



Clearing a gathering yard of snow, this ML4 MobiLoader handles 1½ cu. yd. loads. Elimination of turns saves tracks and steering clutches.

Can Overtime Be Economical?

With the advent of the forty-hour week in the maintenance-of-way departments of the railroads, M/W officers were faced with the problem of accomplishing in the shorter period the same amount of work done previously without increasing costs.

A partial solution to this problem has been reached through the use of new and better machines. However, the investment of thousands of dollars in these machines presented the secondary problem of using them with maximum efficiency. In the final analysis, other things being equal, there is only one criterion of efficiency —low unit cost. The question we wish to raise here is whether conditions of traffic, location, accessibility, etc., are sometimes such that unit costs can be reduced by working overtime.

Many maintenance men take the stand that overtime, except under the most stringent circumstances, i.e., in connection with derailments, washouts or other emergency conditions, should be abolished completely. They contend that overtime is "penalty time," and that its use is pure wastefulness.

On the other hand there are those who contend that the unit cost of a particular project is a factor that should control overtime payments. They claim that if the unit cost can be reduced by working one or two hours overtime per day, then this time is certainly not "penalty time," but, on the contrary, is "dividend time." These proponents of "economical overtime" agree that on routine maintenance work there is no necessity for overtime. However, they do believe that on such work as out-of-face rail laying, surfacing and tie renewals, the unit cost of the work being done should determine whether overtime is justified.

In view of these factors it would seem that the possibilities of achieving economies by working overtime are well worth considering.

A "Prodder" Is a Good Man

When a track supervisor or roadmaster is assigned to a new territory, he is sometimes confused and discouraged by the varying caliber of the section foremen under his jurisdiction. After awhile, the supervisor comes to know his foremen and their capabilities better. He will learn which ones work best when prodded and those who do so when commended.

On the other hand the supervisor eventually realizes that a few of his foremen are prodding him. These turn out to be his best foremen.

These foremen are the ones who know the weaknesses of their territories and who discuss with the supervisor ways to correct bad conditions. Generally, the supervisor can help these foremen obtain the necessary material and equipment to remedy the situation. If the material and machines are forthcoming, these foremen get the work done with dispatch. If machines are not made available, the foremen are generally resourceful enough to find the means to apply the material anyway.

Also, when railroad finances preclude doing certain work when these foremen feel it should be done, they do the best they can in maintaining their sections. But, when times get better, they don't let the supervisor forget that this work should be done as soon as practicable.

A good supervisor works the same way. He is forever prodding his superiors for material, equipment and men to make repairs or improvements to the railroad for which he is responsible. If his requests are not granted, he will not use this as an excuse for not having a good railroad, but he will be persistent in again making his wants known.

The man who prods his superiors for men and material for accomplishing necessary work is going to have the best maintained track.

Here is a "blueprint" for solving the problems facing maintenance-of-way officers today. Basically, what Mr. Hiltz proposes is first to determine the needs of a property to assure adequate maintenance and then to subject to systematic analysis the problem of how to do the necessary work with available funds even though those funds may be somewhat curtailed below previous levels. In his analysis, which is based on a program already in effect on the New York Central, Mr. Hiltz emphasizes greater durability for materials and the use of power equipment. This article is based on an address presented before a recent meeting of the Maintenance of Way Club of Chicago.

In Maintenance of Way . . .

• What Is the Major Problem?
• What Can Be Done About It?

By John P. Hiltz, Jr.
Chief Engineer Maintenance of Way
New York Central System

● The decline in railroad operating revenues, which began in October 1953 and which has continued up until the present time, forcibly points up the necessity for maintenance of way men to look into the future. Despite the decline, gross revenues are still among the largest in history, but many railroads have not been able to allot to the maintenance-of-way departments a sufficient amount of money to carry on a heavy maintenance program.

Admittedly not all railroads find themselves in this predicament; but those which are burdened with a high percentage of passenger traffic, with expensive terminal facilities, and with large amounts of low-revenue mileage, are finding it difficult to cut transportation costs sufficiently to allow for adequate maintenance budgets. Those railroads fortunate enough to be "weathering this storm" should profit by the predicament in which their less-fortunate contemporaries find themselves and lay plans now for some future "storm" which might be even more severe. This problem must be approached with the realization that there is a limit to the savings which can be effected in transportation costs and that further economies are necessary in maintenance-of-way if we are to maintain our properties adequately during a period of declining revenues.

On the New York Central we have plans and ideas as to what must be done to improve present maintenance-of-way practices in order that the expenditures necessary to maintain our property adequately can keep pace with normal revenues. It is my purpose to acquaint you with our findings and ideas.

Before we could determine whether it would be possible to cut maintenance-of-way expenses to keep pace with declining revenues and still progress an adequate budget, we first had to define an "adequate" budget. Proceeding on the theory that, with some possible exceptions, maintenance-of-way work had to be progressed regardless of revenues if the property was to continue in operating condition, we established cycles for all maintenance operations. These cycles dictate that certain operations be conducted at specified intervals of time and provide what we feel is minimum maintenance.

Using these cycles it was possible for us to set up the minimum quantities of the various maintenance items required to keep the property in operating condition without incurring additional deferred maintenance. We were then able to price these quantities by using unit labor and material costs and thereby arrive at the cost of our heavy maintenance program. Next we obtained the total amount of our budget by adding to the cost of our heavy maintenance program, the cost involved in so-called "basic expenditures." These "basic expenditures" will be explained later.

In this way we arrived at a budget for 1954 of $114,000,000. Of this amount only $38,000,000 was properly chargeable to the heavy maintenance program. This meant that $76,000,000 represented "basic expenditures," or those expenditures which we determined would be necessary to properly protect and patrol the property even though we did no programmed maintenance at all. Into this category of "basic expenditures" we placed such items as depreciation, retirements, supervision, personal injuries, joint facilities, stores department charge, basic B&B forces, basic track forces, expenses account of snow and the operating expense portion of investment work. We also included the basic

Facts About the Author

Born on September 8, 1911, Mr. Hiltz is a relatively young man for the large responsibilities he is shouldering today as head of the maintenance-of-way department of one of the nation's largest railroad systems. How he got where he is, and what he has done and plans to do in that position, is a story which is interesting and at the same time significant of what is happening in the M/W field today.

After graduating from Carnegie Institute of Technology with a Bachelor of Science degree in civil engineering in 1934, Mr. Hiltz got his start in the maintenance-of-way field as an assistant on the engineering corps of the Pennsylvania, eventually becoming supervisor of track on the Long Island, then a subsidiary of the PRR. In 1945, George A. Phillips, chief engineer of the Lackawanna, hired Mr. Hiltz as engineer of track of that road, and subsequently promoted him to engineer maintenance-of-way.

This was during a period when some important innovations in maintenance practices were proving their worth on the Lackawanna, such as the so called "detour" system of conducting heavy track-maintenance operations, and the practice of budgeting and scheduling these operations on an annual basis. The president of the Lackawanna at that time was William White, who was deeply impressed by the performance of the road's maintenance-of-way forces. In August 1952 Mr. White left the Lackawanna to become president of the New York Central System where it soon became apparent to him that much could be done to put the M/W forces of the road on a more efficient basis. It was only natural that he should hire Mr. Hiltz to undertake the task of putting needed changes into effect. For this purpose the position of chief engineer maintenance-of-way was created and was vested with system-wide authority. Previously there had been no centralized direction of M/W policies and practices on this system.

In the relatively few months since Mr. Hiltz took the job (February 1, 1953) far-reaching organizational changes have been placed in effect and the operations and practices of the maintenance-of-way department have been altered in major respects. The budgeting and programming of M/W operations on an annual basis have been inaugurated, the cycle method of conducting heavy track-maintenance operations has been placed in effect and important steps have been taken to prolong the life of materials. Indicative of the results being obtained already is the fact that considerably more M/W work has been programmed for 1954 as compared with 1953 in the face of a reduction of about $6 million in the budget.

Some idea of the thinking behind the new practices of the NYC is given in the accompanying article. More details regarding the changes that have been placed in effect are given in an article published in the May 24 issue of the *Railway Age*.

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labor and material charges for the signal and communications departments for the reason that, under depreciation accounting, most of the heavy maintenance work in these departments is properly chargeable to investment.

It was coincidental that the $114,000,000 budget which we determined was required to maintain our property in 1954 practically equalled our 1953 expenditures. Therefore, in order for us to reduce our budget to keep pace with the declining revenues in 1954 it would have been necessary for us to reduce our budget about 12 per cent or roughly $14,000,000, below the $114,000,000 which we spent in 1953 and which we originally determined was necessary in 1954. However, this 12 per cent reduction in our total budget actually represented a 36 per cent reduction in our heavy maintenance program, which I have already stated involved an expenditure of only $38,000,000.

We felt that with our present materials and methods we could not take such a reduction without incurring disastrous amounts of additional deferred maintenance. However, we know that in the future we will be expected to, and must, take such reductions and still adequately maintain our property if our railroad is to withstand the inroads of competition. It was our job to find out how this could be done.

Search for Economies

After analyzing our budget it was perfectly obvious to us that there were three methods which could be used to effect economies. These were:

(1) Reduction of "basic expenditures."
(2) Lengthening of cycles insofar as the life of materials is concerned.
(3) Reduction of unit labor costs for program work.

I would like to treat each of these items separately and give you our ideas of what we feel must be done in the future to make them possible. I do not mean to imply in this discussion that the New York Central, without assistance, is going to be able to put all of these ideas into effect. However, we feel that they must be established as goals and that the time is appropriate for all railroads, all suppliers, and all railroad associations to be aiming toward them.

The reduction of "basic expenditures" is not easily accomplished. Depreciation and retirements represent about 18 per cent of the "basic expenditures" on the New York Central; no reduction in these items can be made through increased efficiency on the part of the maintenance-of-way department. Supervision, which includes the salaries and expenses of clerical forces and supervision above the rank of track foremen and corresponding positions in other sub-departments, represents on the New York Central about 10 per cent of the "basic expenditures." This item could probably be reduced somewhat; however, good supervision pays dividends in increased efficiency and we consider that any effective reduction would be very small. The expenditures in the signal and communications departments represent 13 per cent and those in the basic B&B forces represent 14 per cent of our "basic expenditures." Reductions in these expenditures are possible; however, they would be small as the forces involved are already spread very thin and the type of work which they do is not readily adaptable to the spectacular type of labor-saving mechanization.

Thus far in this analysis I have accounted for 55 per cent of our "basic expenditures" and have not found any place where appreciable reductions could be made without impairing efficiency or incurring deferred maintenance. Of the remaining 45 per cent which has not been considered, basic track forces account for 30 per cent. The remaining 15 per cent is made up of small miscellaneous charges in which some reductions can be made; however, the items are so numerous and the reductions so small, that I will not treat them separately.

Basic track forces represent the largest single item in "basic expenditures" and in our opinion provide the greatest potential source of savings. On the New York Central we define "basic track force" as that section force necessary in the summer time to accomplish miscellaneous work, spot surfacing, inspection and patrol, and that section and extra gang force necessary in the winter time to keep the railroad open during ordinary snow storms. We feel that section forces—or basic forces—are essential to the extent necessary to fill these requirements. You will note, however, that, at the present time, we do not count on this basic force to perform any program work except that amount which they can

accomplish in open weather during the winter season.

If we proceed on the basis that section or basic forces are essential and have been established at the minimum necessary to perform the work now required of them, then the only possibility of savings in this item of expenditure is that which can be realized by having this basic force perform an increasing quantity of program work. In order to do this we must supply this basic force with the means to perform the miscellaneous work, the spot surfacing and the inspection and patrol more efficiently so that it will have time to engage in heavy maintenance. It must have adequate transportation, and power tools, as necessary, to accomplish miscellaneous operations.

The use of better materials will relieve our section forces of some of the patrol and inspection work. The use of automatic machines for program work, which I will also discuss, will once again make our section forces an important unit in heavy maintenance. I have shown that basic track forces comprise a major portion of our expenditures, yet from a mechanization standpoint they have been almost completely overlooked.

Making Materials Last Longer

Our second objective was to lengthen cycles insofar as the life of materials is concerned. You will recall that I previously stated that our heavy maintenance program involved an expenditure of $38,000,000. Of this amount, $23,000,000 represents the cost of materials. The possible savings through increasing material life are perfectly obvious.

On the New York Central we have many plans and ideas for accomplishing these aims. I would like to cite one plan which we intend to put into effect this year and which is an example of what we think must be done in order to realize our objective of reducing material costs. Through the cooperation of the manufacturers we have been able to secure end-hardened rail. At our instigation, a contractor is building a surface-grinding machine which will be capable of removing 0.008 in of metal from the entire surface of the head of both rails at a rate in excess of one mile of track per hour. By using this machine on a cycle basis on our end-hardened rail we feel that we will retard rail-end batter appreciably, eliminate secondary batter which develops on end-hardened rail, eliminate corrugations and other surface imperfections, and reduce the undesired effect from engine burns.

This is the type of approach we are trying to make toward lengthening the effective life of all of our materials. Such steps must be taken if we are to reduce the tremendous material bill which comprises such a major portion of our heavy maintenance budget.

Our last objective in reducing maintenance budgets was the reduction of unit labor costs for program work. On the New York Central, track labor for program work accounted for $9,500,000 of the total of $38,000,000 which made up our heavy maintenance budget. I repeat that this expenditure is in addition to that involved in basic forces which I have already discussed.

We do not discount, to any degree, the tremendous advances which have been made since 1945 in the reduction of unit labor costs. This reduction was accomplished by machines which were developed through the commendable efforts of both suppliers and railroad men. Only by accomplishing this reduction were we able to adequately maintain our properties in the face of constantly rising costs.

While the machines which accomplished this reduction were "life-savers" in their time, we feel that the recent decline in revenues forcibly indicates that these machines are now, or soon will be obsolete. I know that many railroad men and suppliers will take issue with me on that statement. However, if we, on the New York Central, had to reduce our budget 12 per cent in 1954 in order to keep pace with the present decline in revenues, we could not afford to supply the manpower necessary to run most of the machines which we now have.

I certainly wish that I had designs and specifications in my pocket for the type of machines we have in mind, but I do not. I do, however, know what we are going to require and I am going to describe some of our ideas relative to these requirements.

Ideas for New Machines

If outside industry can build an anti-aircraft gun which automatically sights, fires upon, and destroys a target, the railroad industry can build a tamping machine which automatically raises its own track, carries its own grade, and tamps uniformly. Our present tampers are good and we have enjoyed tremendous benefits from them. However, I do not think we can long afford to assign 10 to 20 men to a surfacing operation which can be done by 1 or 2 men with the proper machine.

If candy manufacturers can have machines that automatically mix, dip, cut, wrap and pack their products, the railroad industry can have a machine that will automatically remove the spikes from an old tie, eject it, insert a new tie and spike it to the proper gauge. We have many machines today to do these various individual operations and they do them well and with great economy over former methods. However, with less money to spend and with higher labor and material costs, we will not be able, in the future, to assign 15 to 30 men to renew ties when the proper machine could accomplish the job with 2 or 3 men.

We need automatic welding and grinding machines to build up rail ends and driver burns. We must have lining machines which can line track automatically with rapidity and a fine degree of accuracy. We will require devices to deliver ties and ballast automatically at the locations needed and in the quantities desired. We should have all equipment constructed so that the operations can be performed regardless of weather conditions.

Fantastic or not, it is my considered opinion that we must have machines of this type if we are to continue to maintain our properties adequately. Such machines will involve a considerable expense for research and development and will require substantial investment of capital. If our suppliers can't finance the development, individual railroads or railroad associations will have to participate.

If we are furnished such machines, basic forces would be large enough to accomplish program work. If we mechanize the miscellaneous operations of our basic forces as discussed earlier, they will have time available for program work. We will then be able to enjoy the protection afforded by basic forces without the attendant large expenditures which now contribute little toward accomplishing heavy maintenance.

The savings which could thus be realized, added to those which could be attained through extending the life of materials, would enable us, for a time at least, to cut our budgets to keep pace with a normal decline in revenues. I am quite certain that, at the present time, no maintenance-of-way department which is fully utilizing the machinery and improved practices available, can do this without incurring deferred maintenance.

In this installment, Mr. Blanchard describes the "projection" method of lining both tangent and curved track as he has taught it to many lining foremen. He also points out the difference in methods used by an inexperienced track liner and an expert when lining a curve and tells what to do when a curve is badly out of line. The next and last installment will deal with instrument lining and will reveal some of the secrets of the "old-time" track liners.

THE EXPERT LINER will throw inward all parts of the curve which project outside of his imaginary curved line. Here, men are getting set for an inward throw.

The Art of Track Lining . . .

Part II—Good and Bad Techniques

By L. C. Blanchard

Roadmaster
Chicago, Milwaukee, St. Paul & Pacific
Minneapolis, Minn.

● How does one project a straight line for an indefinite distance? This is the "$64-question," the solving of which will either make or break you as a track liner.

You concentrate on one rail at a time! It is as simple as that, yet it took me several days of the most intensive practice under the tutelage of an expert to feel certain that I had mastered what to me was a new technique. I first had to forget a great deal of what I thought I knew about lining track and start all over.

I had lined track as a section foreman. I thought I had good eyes and because my neighboring section foremen called on me to do their lining, I held a pretty good opinion of myself as a track liner.

On the first morning that I reported for extra-gang duty, the general foreman, who had put in four years in the Kaiser's army and was a toughie, asked me whether I could line track. With all the confidence in the world, I said "Sure."

"Are you sure?" he asked, and I replied, "Well, I think so."

"We'll soon find out," he said, "and if you can't, back you go where you came from."

About 10 o'clock when I thought I was getting along fine, he showed up and said, "I thought you said you could line track."

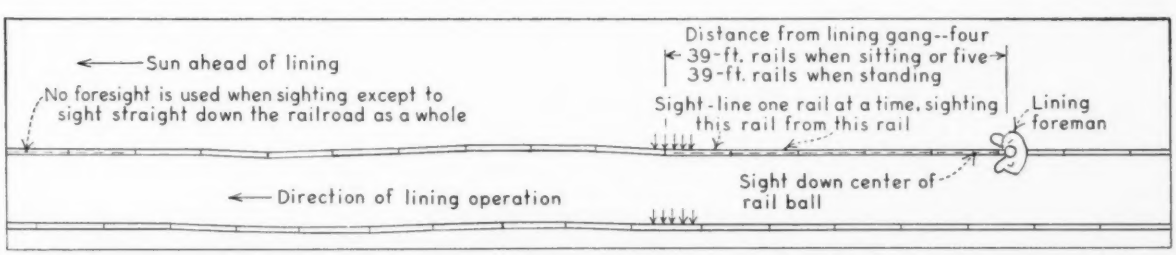
"What do you mean?" I answered.

"I mean you can't line track. Your track isn't straight."

I told him, "I thought it looked straight."

He then instructed me to sit down on the rail and take a good close look back over the track I had just lined. I had to admit that there were tiny deflections, or what we call "hair-line swings," visible in it.

"Now then, you can see those deflections sitting down, but you can't see them when standing up. Right?"



THE "PROJECTION" METHOD of lining places the lining foreman about 150 ft from his gang and lining one rail at a time. When sitting he lines the fourth rail from the third and, when standing, the fifth rail from the fourth.

HAVE AN ASSISTANT go ahead with a measuring instrument to find out how far off center the track is at a stake. This makes lining more accurate.

I had to admit that this was so.

"All right, if you lined it so it looked straight when you were sitting on the rail, it would look straight when standing above it." I admitted that it seemed logical.

"Now then, do you want to learn to line track as it should be lined, or do you want to go back to the section?"

I told him that I was there to learn.

Instructions by an Expert

He then instructed me as follows: "You will line the track from a sitting position on the rail, exactly 150 ft from your men with your nose directly above the rail, and sight down along the center of the rail ball, rather than along the gage side of the rail. You will maintain the same distance between yourself and the men at all times.

"As each rail is lined straight, you will line the next rail straight away from the last rail, making sure that it is straight throughout its entire length and pointing in the direction it should go. Make no attempt to strike any point immediately ahead, other than to keep the rail pointed straight down the railroad as a whole. This will automatically erase any swings or deflections in the line without trying to guess where each deflection should end. If each rail is kept straight from the last lined rail, it will never be necessary to back up or go over the work a second time.

"The exception to this is a bent rail that is impossible to line straight. When a bent rail is encountered, all that can be done is to line on beyond it and to look back to make sure you got past it all right. If not, you will have to drop back and adjust that point. Under this system the guesswork is largely removed from lining and it becomes a precision operation. Each lined rail becomes the guide for indicating what must be done with the next rail ahead."

Those were my instructions. After intensive practice, I learned them and nothing in my life has paid better dividends. After I had completed five miles of track behind a maintenance gang, this same general foreman walked back over it with a transit to check my work. When he had completed his check he told me with the pride any coach would have in a good pupil that he couldn't find a single deflection in the line over the entire five miles.

Old System Meant Extra Work

Prior to receiving this lesson, I had supposed that you lined each rail by pointing it to come out at some point not too far distant, with no concentration on getting each rail straight away from the last lined rail. Under this guessing system it was necessary to go over the same piece of track two and three times to obtain anything approaching a straight line.

There is a time-worn story about the old section foreman whose sight was beginning to dim. As he was lining the track one day, the throws were getting heavier and heavier. Just as he realized that something was wrong, the roadmaster arrived and asked him what he was lining toward. The foreman pointed out a black speck on the hillside ahead and said that he had picked that out as a landmark to point his line. A closer look revealed that it was a cow grazing along at a right angle to his line of sight.

If there is any point to this story, it is this: With few exceptions it is wrong to pick out any particular spot ahead to line toward. Under the projection method, if each rail is lined straight away from the last lined rail and pointed toward where the track disappears over the horizon, all deflections will automatically be erased from the line just as is done with an optical lining instrument.

Like Building Fence

To illustrate this point still further: Nearly everyone has had some experience in building a fence. If you were building a fence a half-mile long, you would go to the far end and plant a post, and perhaps place a flag on it for easy sighting. You would then start a line of posts at the other end, pointing them toward this first post. As each new post is being set, you would step back to the third or fourth post and sight over them to project a perfectly straight line toward the distant post. There is no doubt that your line would end up straight.

But, suppose you didn't bother to go back three or four posts each time to do your sighting, and instead stopped at the first post and concentrated on running your line toward the distant post. This would change it from a precision operation to a guessing one, and you would end up with a lot of zigs and zags.

Now I realize that for many of you this may seem to be laboring the matter, but, after teaching the projection method of lining to upwards of 50 foremen, you would be surprised how difficult it has been to get this simple point across. There seems to be something unnatural about it when you try to apply it to the lining of a railroad.

One day I came upon one of my very good section foremen lining track. I watched him for awhile and then asked him why he was going over his work for the second time. He replied that he always lined track in that manner, i.e., he went over the track once to get out the big swings, a second time to get out the little swings, then a third time to make the finished line. I asked him why he didn't put the finish line on the first time he worked over the track, and he said you couldn't do that. I asked him why not and he said he didn't know, but he had never heard of track being lined that way.

I then asked him if I could try my hand at it. When I had finished with about one-third of a mile of lining, he exclaimed, "Gee! But that track is straight!" While I was doing the work, I had him stand in back of me while I explained why each move was necessary. At the conclusion of the work, he said, "All right! If you can do it, then I can do it."

Some time later, I happened along just as he had finished lining a long stretch of track and, even though it was light rail, old and worn, I have never seen a more beautiful line. This man was past 60 years of age at the time, and wore bifocal glasses. Before he had tried the projection method, he was just a fair-to-average liner, but almost overnight he had turned into an expert through his own desire to improve.

I have seen this experience repeated in somewhat similar fashion time and again. Because of it I am convinced that almost any man, who desires to become a track liner and will work at it, can become a really good track liner. At our rules classes and safety meetings, I often have slipped in some discussion on track lining, stressing the point of using each lined rail as a guide for lining the next rail ahead. Surprisingly, the men would tell me that they were anxious to get home and try out this method, that they had never had lining explained to them in this way. It gave them something solid to work on, whereas lining had previously been something of an ordeal.

Reading this article will not make a man into an expert track liner. Just as in learning to drive an automobile you have to develop an instinctive reaction through practice on just how much you turn the steering wheel, so you will have to practice to develop your aptitude for throwing rail the right amount. Practice, plus constant attention to the points previously mentioned, is required before the liner can expect to become an expert.

PROPER SPACING of men when lining curves is important. About two-thirds of the bars should be beyond the stake when throwing the track.

Lining Unstaked Curves

We have been talking about lining straight track. Now, what about curved track? Exactly the same principles apply. Instead of projecting a straight rail from a straight rail, we simply project a curved rail at the same degree of curvature from the last-lined curved rail. The previously lined curved rail is your guide as to how much the next rail ahead must be thrown. Actually, most liners would rather work on a curve than a tangent. Somehow, it seems more natural to project a curved rail from a curved rail than to do the same thing from straight rail. On a curve, there isn't much else you can do. Logically, if the principle is correct for one it is for the other.

The difficulty many liners experience in working on a curve is that they try to throw all the flat spots outward to make the curve appear round. The expert studies a curve with the idea of determining how much of it can be thrown inward. He watches carefully for the first rail that deflects outside of his imaginary curved line. He throws inward at this point, yet still projects the normal curve line. In many cases this will eliminate the flat spots without any outward throws being necessary. Only rarely are outward throws required, and then usually because of either bad level or too much elevation through part of the curve. On a curve that is very badly out of line, it might be necessary to make some outward throws to compensate for rail expansion. Curves that are badly out of line should be center staked.

A good eye liner can produce a reasonably good ride on curves up to speeds of about 60 mph. Above that speed, it would be expecting too much of a foreman to produce good riding track unless the curve is in good general line and needs only a little touching up.. Perhaps we should mention here that it is not proper to sit down on the rail when lining a curve. It is necessary to stand and to move up to within about 120 ft of the men. This distance will vary with the degree of curvature.

Lining Curves to Center Stakes

Now a word about lining curved track to center stakes. You can read an endless amount of wordage about methods of transit lining or string lining of curves, with further instructions for driving the center stakes and placing the tack—but there the subject is dropped. The instructions do not contain one word as to how the lining foreman is to proceed for obtaining an economical and accurate job of setting

STAKE will not move if a shovelful of ballast is removed from the pressure side before making the throw.

TIME WILL BE SAVED, where a heavy throw is involved, if ballast has been dug out from the ends of the ties.

the track to those center stakes. If this procedure has been published, it has never come to my attention.

What does the inexperienced track liner do when he enters a curve that has been staked? Nine times out of 10 he will start in by walking his gang to successive center stakes and throwing the track at those points, then he will place a stone on the rail to mark each spot. He will then start back around the curve and make his throws between the stones that he had placed on the rail, that is, if the stones have not been knocked off in the meantime by a motor car.

After these throws have been completed, the inexperienced track liner will make a third trip with his gang around the curve to make a final check on the stakes, only to find, however, that a great many points show from ¼ to ¾ in from being properly centered. The reason is this: When he makes the intermediate throws they tend to move the track from the points where he first threw it. It is at this point that some lining foremen get angry and kick the stakes to fit the line. It simply is the wrong way of going about the job, and far too time-consuming, as it will require from three to five trips around the curve to obtain the proper alignment.

Employ an assistant

The right way to line the curve is to have an assistant go ahead with a measuring instrument and line the track to center at the first stake at the beginning of the spiral. The assistant then proceeds to the next stake and indicates to the lining foreman just how far off center the track is at that point. Using the projection method, the foreman makes two throws between each center stake by eye, after which the assistant measures the third throw to the center stake. Instead of placing a stone on the rail to indicate the location of the stake, the assistant places a pinch of ballast. This will be harmless to a motor car if one should run over it, and can be seen just as well.

So that the track will be left exactly right at the center stake, the important thing is to have the men properly placed with their bars. If the center stakes are 39 ft apart, locate the lining bars so that two-thirds of them are beyond the stake when the track is thrown to center. Make the following two intermediate throws by eye, then again have two-thirds of the lining bars beyond the center-stake point when the track is thrown to center. By doing the work in this way, the rail will not be moved away from the center stake when the next intermediate throw is made.

Under this system, a competent lining foreman will be able to go around a curve only once and leave it in a very satisfactory alinement if the maximum throw does not exceed four inches. Where the throws exceed this amount, it will be necessary to make preliminary throws before the final throw to the stakes can be made. A lining foreman who will give serious thought to this matter can improve his accuracy and save a lot of time in lining a curve.

Curves Badly Out of Line

Where a curve is badly out of line and when time is more important than any other consideration, it is possible for one lining foreman to work two lining gangs simultaneously. One gang should work 120 ft ahead of the lining foreman, making the heavy throws, and the other should be 120 ft to the rear of the foreman, setting the track to the center stakes in the manner outlined above. While I would not recommend this as a regular practice, it is one of the tricks of the trade that can be used to advantage now and then.

Lining a curve to center stakes presents some other problems that should have the attention of the lining foreman. Some types of ballast tend to move with the ties when the track is thrown. In such instances it is possible that the center stakes will also move as the track is thrown. To avoid this, a shovelful of ballast should be removed from the pressure-side of the center stake. With the pressure relieved, the stake will remain solid and true.

When you run into a heavy throw, it will save time to dig out the ballast from the ends of the ties, so you should have tools available for that purpose. Also, digging out at the ends of the ties will help preserve the level and surface of the track. Remember this: A careless lining foreman can ruin the best efforts of a surfacing foreman by humping the track out of level. While lining, you should use every care to protect the surface and level of the track. If you do not, it will eventually disturb your own work, because track that is not level will not long remain in good line.

[The third and final installment, to be published in the July issue, will deal with the use of instruments for lining track. It will also tell how to handle tight rail and sun-kinks, will give tips for increasing speed and accuracy, will outline the proper procedure when lining through highway crossings and turnouts, and will tell how to line track employing only a section foreman and two men. Editor.]

POWDER-ACTUATED rail punches which can be handled by one man were used to make all holes in rail during construction of 75 miles of new trackage.

CARTRIDGE is discharged with a hammer to drive piston forward and . . .

. . . PUNCH OUT "slug" which is retained by a die on opposite side.

When Laying Track . . .

Holes Punched in Rail Webs

● The T. F. Scholes Company, rail contractor, used cartridge-actuated punch equipment for making holes in rails on a recently completed track-laying project at the Navy's Camden (Ark.) ammunition depot.

With two sub-contractors doing the bonding, the 500-man organization was able to complete approximately 75 miles of trackage, including numerous turnouts, in eight months time. All bond holes, as well as holes for guard rails, heel blocks, closure rails, etc., were punched with the new Velocity-Power Rail Punch.

In laying the tracks the first step was to construct the turnouts—one to each large powder magazine—at 400-ft intervals. After all of the turnouts were completed, the connecting line was built. Each turnout required the punching of 24 holes for splicing and bonding. As a safety precaution, the bonds were grounded at the terminus of each rail spur to eliminate static electricity near stored ammunition.

The construction work was divided among six track gangs, each of which was equipped with one of the rail punches. The holes punched ranged in diameter from ¾ in to 1¼ in for most of the project; however a few special sized holes were also punched. The punches are portable and self-contained, and were moved along the rail as the job progressed. Only one man was required to position, load, fire and move the 70-lb device.

According to the contractor, operation of the equipment is quite simple. The piston and the punch unit are assembled in the punch frame, and the complete tool is placed over the rail head at the desired location. For correct vertical alignment, a spacing plate or template may be inserted between the rail head and the punch frame. The receiving die is then placed in position and the punch is clamped to the rail by tightening a die-retaining bolt. A small blank powder cartridge is then inserted, and the operator simply taps a firing pin with a special hammer to discharge it. There is relatively little noise and no recoil or open flash. Gas pressure generated by the cartridge drives the piston forward which, in turn, pushes the punch unit through the rail web. The punched hole is then ready for bond plugs or bolts.

The metal "slug" which has been punched out is stopped and contained on the leaving side of the rail web by the replaceable, locked-in die that opposes the firing unit. Actual timing in the field showed that the entire job of punching one hole—positioning the mechanism, inserting the blank cartridge, firing and removing the "slug" from the receiver—required approximately 2½ min.

RECONSTRUCTION was done on one side of the structure at a time so that traffic could continue over the other track.

Through-Girder Bridge Has

Prestressed Concrete Floor Slabs

WELDED STEEL girders with web stiffeners at 6-ft intervals and special shear-plate connections for the concrete slabs to rest on were set on prepared bearings.

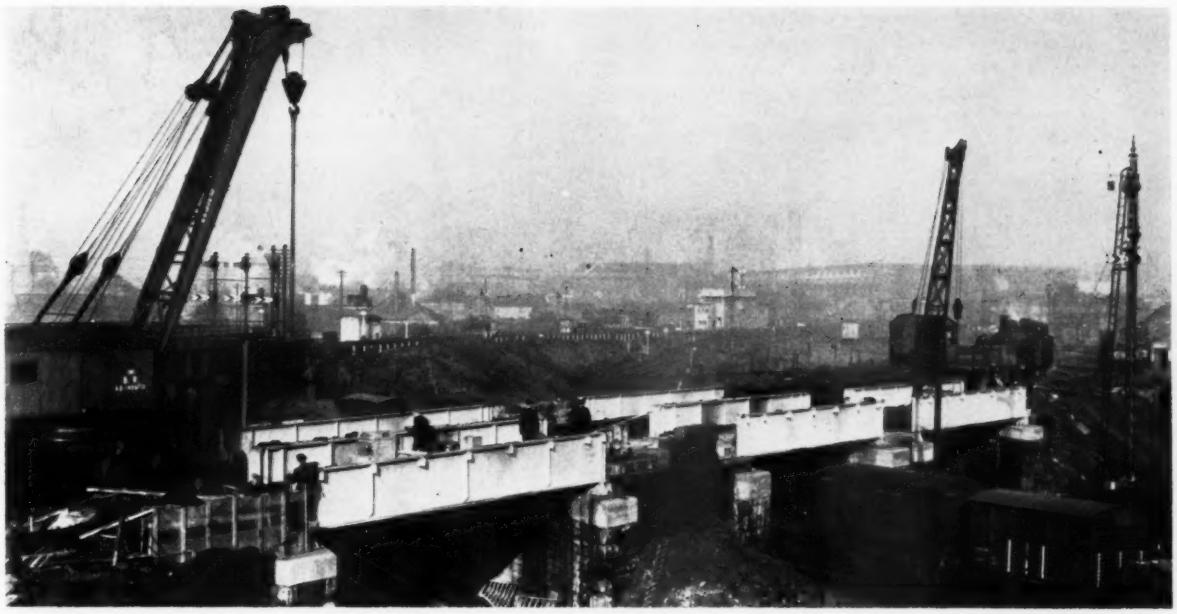
Because of limited overhead clearance and to carry on construction with a minimum of interference to railroad traffic, a new method of design was adopted for a three-span viaduct carrying freighthouse tracks over a main line in England.

● When it became necessary in England to replace an old three-span bridge carrying a double-track serving the Crown Street freight depot at Carlisle, several construction problems presented themselves. Overhead clearance for main-line tracks running beneath the bridge was quite low, and the grade of the freighthouse tracks running over the bridge was already at a maximum thereby making it impractical to raise the structure to any great extent. In addition to these complications, traffic both over and under the viaduct was quite heavy.

A design was chosen which, it was felt, would provide a minimum of construction depth and maintain adequate overhead clearance for the tracks below the spans, and would also speed construction work so as to cause a minimum of interference to movements over the structure. The design adopted is of the through-girder type with two outside girders and a common inside girder. The girders are all-welded and have intermediate web stiffeners at 6-ft intervals. Special shear-plate connections are attached to the stiffeners, which in turn serve as fastenings for lateral T-section members that tie the inner and outer girders together and provide lateral bracing. The floor system consists of prestressed concrete slabs placed between the girders and resting at each of their four corners on the special shear-plate connections. These connections transfer the load directly to the webs of the girders rather than to the bottom flanges.

Floor Slabs Precast

To expedite construction, the floor slabs were precast in 6-ft lengths, weighing about 5 tons each. They were poured 12 in thick and prestressed by the Freyssinet method, using 12-wire cables. With this method rubber Ductubes are placed in the form when pouring the slabs, and after the concrete has cured for 28 days, Freyssinet cables are threaded through the



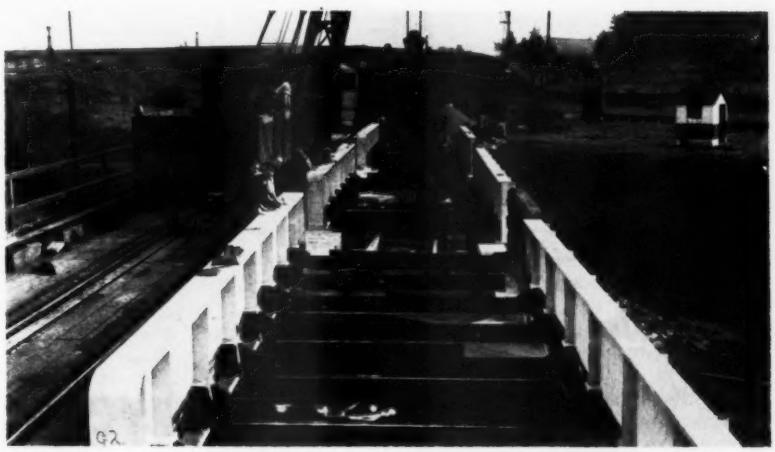
MINIMUM OVERHEAD clearance for lower tracks and a steep grade on upper tracks precluded use of an ordinary design.

ducts and prestressed to the desired degree. After prestressing the ducts are filled with grout under pressure and the ends of the cables are encased in concrete.

Because of the position of the tracks beneath the span the intermediate piers are tapered in plan. One of them averages 28 ft in width and the other 21 ft. Because of the skew, a special problem was created with reference to the floor system over these piers and between the spans. It was not considered desirable to have a different type of floor system over the piers than on the spans because of plans to attach the running rails directly to the concrete floor slabs. Therefore, special concrete supports were placed on top of the piers between the ends of the adjoining girders to serve as bearings for precast concrete slabs similar to those used on the steel spans. Prestressing cables were then run longitudinally through all of the slabs on the three spans and intermediate piers and anchored at each end by means of Freyssinet cones. In this way the concrete-slab floor system was carried throughout the structure from one abutment to the other.

Steps in Reconstruction

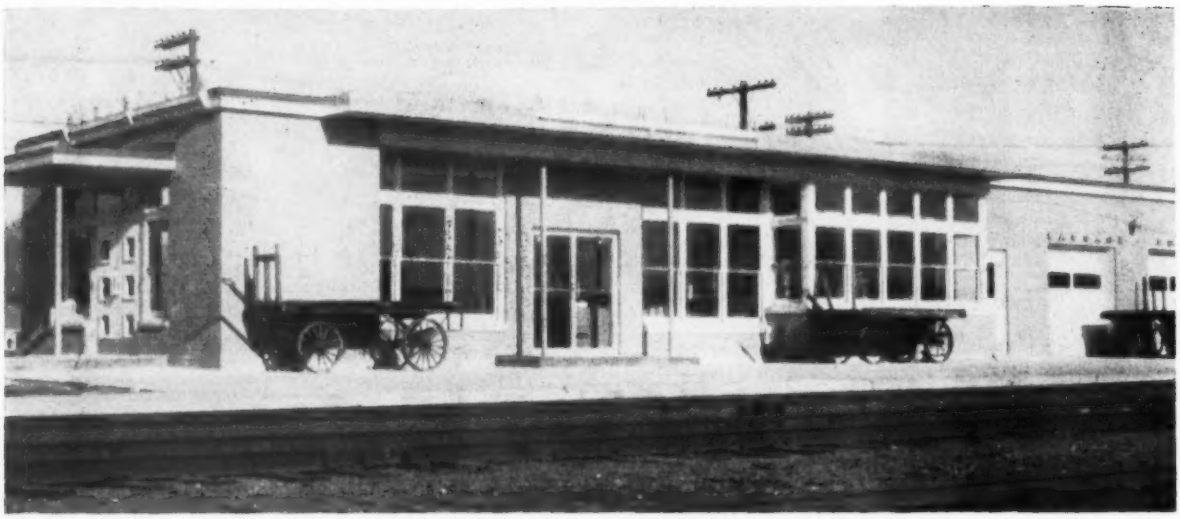
Reconstruction work was carried out on one track at a time so as to keep the other line open for traffic. First, all of the superstructure of the old spans was removed one span at a time and temporary spans were installed on one-half of each of the piers and abutments to carry traffic during erection of the other half of the new structure. The portion of the piers and abutments which had been cleared was then prepared for the new girders and floor system. After the girders were placed in position, the lateral bracing was installed between them and the deck slabs set in place. Temporary crossties were then placed on top of the floor slabs, thus opening the track for traffic and allowing the other side of the bridge supporting the companion track to be rebuilt. Both tracks were completed by placing steel plates over the concrete slabs and attaching the running rails directly to the steel plates. No ties or other wood members were used in the permanent decking of the bridge.



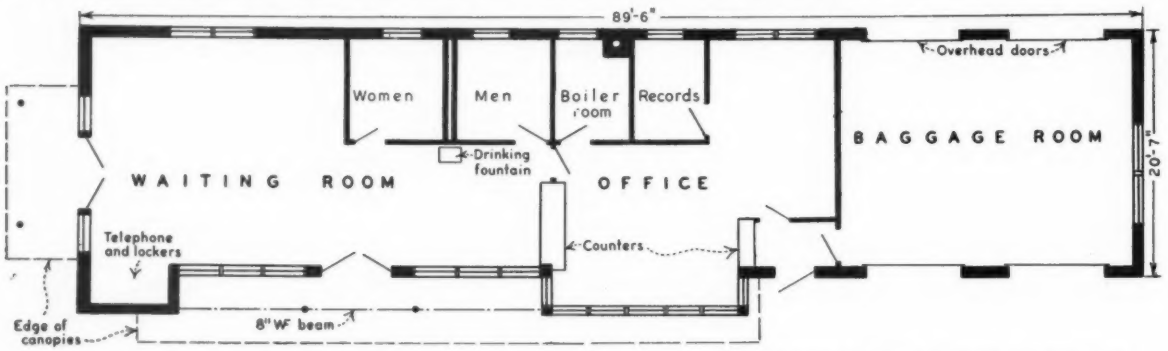
GIRDERS were tied together with T-section members, and the precast slabs (not shown) in 6-ft lengths were set in place on the spans and over the intermediate piers.

Since the low clearance below the spans precluded the use of smoke plates to protect the steelwork from smoke and blast, the bottom flanges of the girders were aluminum sprayed before installation to a thickness of .006 in. The remainder of the exposed steelwork was also sprayed, but to a thickness of .003 in. Concrete slabs were coated on the underside with a bitumen compound, and on the top surfaces with a hardening solution.

We are indebted to the *Railway Gazette* of London for the information and the illustrations used in this article.



NEW STATION is located about 400 ft north of the old building location. Lighter foundation loadings were effected by the use of brick veneer and by specially designing the waiting room canopy as a portion of the roof system.



FLOOR PLAN shows how glassed-in waiting room wall was recessed and a steel beam installed to carry the roof load.

Unstable Soil Requires . . .

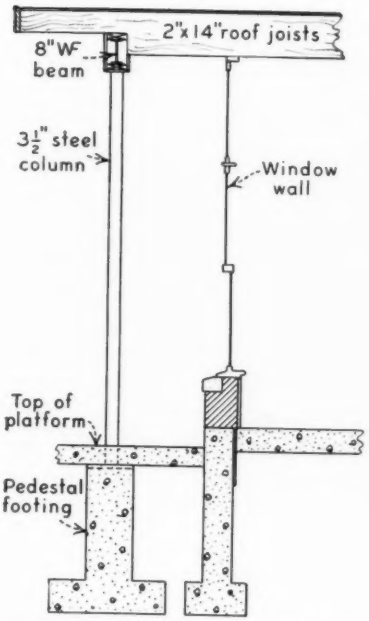
Station of Lightweight Design

● The Rock Island's half-century-old station at Albert Lea, Minn., had just about seen its day. The old station was not only showing its age but had also suffered considerably from settlement of its foundations due to the unstable nature of the supporting soil.

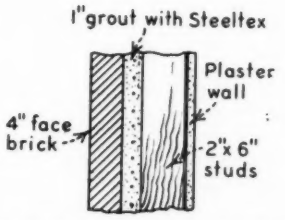
In making plans to replace the old building with a new structure, soil tests were conducted which disclosed that the soil bearing capacity was such that it was necessary to design the building with wall loadings as light as possible, consistent with good design. However, it was desired to have a building of brick exterior because of appearance and in keeping with the road's policy on architectural design of new station buildings. In addition, because of severe winter weather, a design which would provide an exterior cover so that interior work could be completed during bad weather was desirable.

A design for a lightweight brick wall was adopted which reduces materially the dead weight of the walls and which, in addition, possesses the elasticity of a frame structure so that, if settlement does occur, the danger of serious cracking will be reduced. The wall is of a brick veneer type; however, instead of employing the usual veneer construction in which an air space of about 1 in is left between the brick work and the sheathing, a new technique was used. In this technique a product known as Steeltex—a wire mesh reinforcing with a heavy paper backing—is stapled to the studding in such a way that the mesh can be pulled away from the paper when desired. The brick face is then built up with a clearance of 1 in from the studding. As the brick work progresses upwards, the wire mesh is pulled out to the center of the void between the brick and the studding and the void filled with the same mortar grout used for the brick work. Thus, in effect, a reinforced concrete slab is formed behind the brick face in such a manner as to form a monolithic unit with it.

This type of construction had the added advantage of permitting the shell and roof of the building to be constructed during bad winter weather when masonry work could not be accomplished. It would thus be possible to put the structure in service much earlier



STRUCTURAL details of canopy and footing design are shown by cross section through trackside wall.



CROSS-SECTION shows construction of Steeltex and brick veneer wall.

Because of the low bearing capacity of the underlying soil, the Chicago, Rock Island & Pacific adopted an unusual type of wall and footing design in building its recently completed station at Albert Lea, Minn.

than would otherwise be possible while waiting for better weather to lay up the brick exterior.

Canopy Specially Designed

In arriving at a design for the trackside of the building, it was desired to incorporate as much window area as possible across the front of the waiting room and bay. In addition, a canopy for overhead protection of the entrance to the waiting room was considered desirable from a functional as well as an artistic standpoint. However, because of the low bearing capacity of the soil, a regular cantilever extension of the roof as a canopy was ruled out since this type of construction would require that extra heavy footings be placed under the trackside wall in order to support the excess weight of the overhang. Therefore, to reduce the overhang area of the canopy and still maintain a sufficient cover to afford adequate protection from the weather, a portion of the wall between the end of the building and the bay was recessed 3 ft.

Since the recessed wall as well as the bay window wall is of about 75 per cent glass construction and cannot support the roof joists, pedestal type footings were poured at the corner where the recess of the wall begins, at each corner of the bay window and at intermediate points between the bay and the corner of the recess. These footings carry 3½-in steel columns which in turn support an 8-in wide-flange beam. This beam supports the main roof joists, thus removing the roof load from the glass walls. Beyond the beam a lookout was extended as a cantilever an additional 3-ft which makes the total protected area under the canopy 6-ft in overall width, yet adds very little additional weight to the supporting soil above that of the normal roof load.

Footings Equalize Load

All building footings were designed for 1000 lb per sq ft so that if settlement did occur, it would be uniform throughout the building. Footings under the end walls were designed somewhat smaller than those under the trackside and streetside walls since the only weight imposed upon the former is that of the wall alone while the latter are required to carry the weight of their respective walls plus the weight of the roof. Because of the glass construction of the bay and recessed waiting room walls, it was not necessary to design these footings as heavy as those under the brick walls.

It's Attractive Too

The new station is located about 400 ft north of the location of the old structure, which has been dismantled. In keeping with the modern trend of architecture, the new building features a low, flat-roof design. The exterior brick is orange tone, iron spot, and the exterior trim is painted reddish brown. For easy identification and to carry out the modernistic styling, stainless steel station signs 9 in high have been placed on the roof at both ends and on the track side. Around the south entrance to the waiting room and along the south side of the building space has been provided for a planting bed.

A new 700-ft platform has been built along the trackside of the station. The platform consists of a 5½ in reinforced concrete slab. Lighting for the platform and station grounds consists of service-station type lamps.

On the interior the floor is finished with ⅜-in terrazzo in the waiting and toilet rooms and with asphalt tile in the office portion. The subfloor is a 5½-in reinforced concrete slab. Walls are plastered over gypsum perforated lath which is backed by aluminum reflective insulation. The walls are sand finished and painted dark green in the waiting room and light green in the office. Toilet room walls are covered with ceramic tile. All interior trim is solid oak stained grey.

Bright Interior

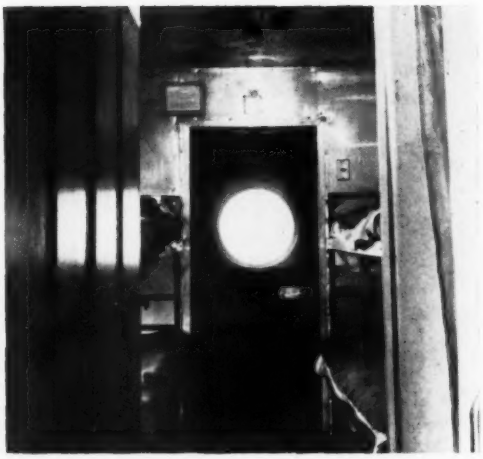
The ceilings throughout are acoustical tile, and lighting is provided by fluorescent fixtures recessed in the ceilings. During daylight hours the interior receives a generous amount of light through the large windows on the track side.

The ticket office has a counter of plywood construction and is glassed in from the counter top to the ceiling, thus giving a wide-open view and feeling as one looks out through the waiting room and on through the front window wall to the platform and track. An attractive planting box has been placed in the center of the streetside window in the waiting room, which, together with an assortment of laminated-wood and plastic furniture, gives the room a bright, comfortable feeling. The waiting room also has an alcove in one corner containing a telephone booth and parcel lockers.

This building was designed and constructed under the general direction of W. B. Throckmorton, chief engineer of the Rock Island, and T. J. Engle, engineer buildings. The design work was under the direct supervision of W. C. Humphreys, architect. The R. C. Elvin Construction Company, Minneapolis, Minn. had the contract for the project.

Special Purpose Units for Large Camps . . .

KITCHEN UNIT is provided with a stove, an ice box, a double sink, and cabinets for the storage of food. Cook's quarters are in rear.



DORMITORY TRAILER, one of the longer units, will accommodate six men.

DINING CAR is generally spotted adjacent to the kitchen trailer and connected to it by a short "runway."

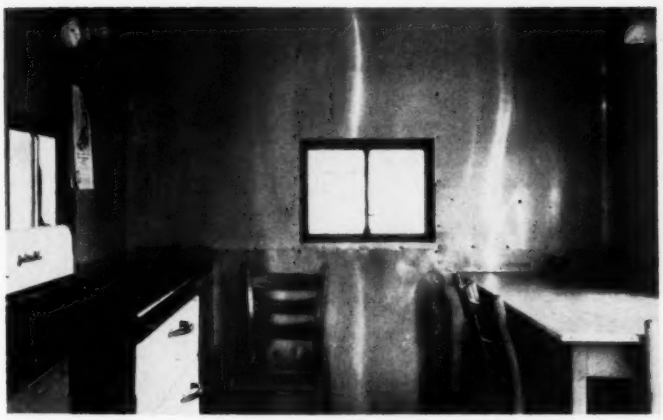
Southern Starts Practice of

Using House Trailers

The long-familiar camp cars are on the way out on the Southern. This road has begun the use of aluminum house trailers for housing its bridge-and-building and track-maintenance forces. These units are insulated against heat and cold, are well-lighted and ventilated, and are provided with some modern household facilities.

TRAILER CAMP is comprised of several types of units. Some are designed for a special purpose such as cooking, dining or sleeping. Others are built as self-contained units which supply facilities for all-purpose living.

Self-Contained Units for Small Gangs . . .



FOUR-MAN unit has cooking and dining facilities at one end of the trailer which are separated by lockers from . . .

. . . SLEEPING QUARTERS containing bunk beds at the other end of same unit.

● Sturdily built and completely weatherproofed house trailers, constructed almost entirely of aluminum, are now in use on the Southern for housing track-maintenance and bridge-and-building forces, and other work parties, which spend several days or even weeks on jobs located too far from their homes for daily trips to and from work. Separate and combination units are provided for cooking, dining and sleeping quarters.

In the construction of the bodies inner and outer walls of aluminum sheeting are riveted to aluminum studs with aluminum rivets. The roofs are also made of aluminum sheeting. The underframes are of welded steel construction and the floors are of ¾-in marine plywood flooring covered with rubber linoleum to give them a good finish and better wear and insulating properties. To preserve the frame and further seal the floor, the entire underside of the trailer is coated with a substance similar to that used to undercoat automobiles.

Fiberglas wall and roof insulation helps keep out either heat or cold, while ventilator fans keep fresh air circulating through the trailers. In cold weather an oil heater built into each trailer can be turned on to provide warmth. All trailers are wired for electric lighting and all but the dining trailer have an enclosed shower with hot and cold running water available.

Sleeping accommodations consist of single-width, full-length beds. In trailers housing more than two men, some of the beds are double-tiered.

Two of the six types of trailers measure 22 ft in length and the others are 18 ft long. The two longer ones are a four-man work trailer and a six-man dormitory trailer.

The four-man work trailer is designed to house an independent working force of four. The occupants of this unit do their own cooking in a completely equipped kitchen at one end of the trailer. At the other end are two double-tier beds. Like all of the trailers intended as living quarters, the four-man work unit has a wash basin and a table and chairs for writing, dining, or other similar use.

Just as its name implies, the six-man dormitory trailer provides sleeping accommodations for six. Three double-tier beds are "staggered" along the length of the trailer and arranged so that each man has an individually-controlled window near his bedside.

In the kitchen trailer, an 18-ft unit, the cook is provided with sleeping quarters containing the usual furnishings. The kitchen section, in addition to a stove, has an ice box, a double sink, and a number of cabinets for storing food and dishes.

UTILITY SECTION of trailer contains a lavatory, a shower, an oil heater, and hot-water heating tank.

In actual use the kitchen trailer is usually spotted alongside the dining trailer, with a short "runway" placed between the two so the cook may conveniently carry in food at mealtimes. Furnishings in the diner include one or more tables and benches or chairs.

Another of the 18-ft trailers is known as the foreman-two-man trailer. It is divided into two sections by a shower stall. The foreman's section has a work table and is a combination office-bedroom. On the other side of the shower, the other two occupants have a double-tier bed and the usual conveniences.

The fourth of the 18-ft trailers, known as the two-man work trailer, is intended for use mainly by track repairmen (commonly referred to as welders) and their helpers and by machine operators and their helpers. Similar to the four-man work trailer, it has complete kitchen and the other facilities found in the larger trailer.

To support the trailer while is is stationary each unit is equipped with four screw jacks, one for each corner. Wood chocks are provided also to block the wheels. Each trailer has a fire extinguisher.

Stud-Welding Proves Useful When . . .

1 WORN TOPS OF ANCHOR BOLTS are cut off to a uniform height established by stretching a chalk line.

2 TOPS OF CUT BOLTS were ground with a portable grinder to insure sound metal at each weld point.

. . . Relaying Gantry

Because a contractor went from hand-welding to a semi-automatic welding method when extending rail-clip anchor bolts of a gantry crane with threaded studs, he turned his contract from a potential loss into a profit. The faster welding method was used successfully with 1-in. bolts for the first time.

● A project recently completed at the U.S. Naval Base at Philadelphia demonstrated how the stud-welding technique effected substantial savings in time, labor and material when used in connection with renewing and releveling the heavy rails supporting large ship-building gantry cranes.

The gantry cranes operated on each side of a pier serving Drydocks No. 4 and No. 5. Over a period of years of heavy usage, the fill forming the pier had settled unevenly, so that the rails forming the tracks for the cranes were also out of level and produced unsafe working conditions, particularly when the cranes had to transport heavy loads laterally. Six tracks were involved.

The 175-lb. crane rails were each supported by a metal bedplate on concrete pads and were held in place by rail clips and anchor bolts, 1 in. in diameter and 24 to 30 in. long, with hook heads embedded in the concrete. The plan of rehabilitation called for removing the rails and bedplates, chipping out the grout, cutting off the anchor bolts to an even grade, and welding on stud extensions, including the provision of leveling nuts under the base plates to insure exact conformance with grade for the final installation.

Many Poor Hand Welds

The Conduit & Foundation Corporation, Philadelphia, undertook the contract for raising the rails to the original grade. Everything went smoothly until the men attempted to weld on the bolt extensions by hand, using a ring-weld technique. Rigid inspection disclosed that a high percentage of the hand-welded extensions were below minimum strength requirements. Faulty extensions had to be rewelded.

The contractor, seeing that his profits would be "rewelded" out of existence because of poor welding conditions and unavailability of experienced welders, searched for an alternate method of applying the extensions. After some pilot tests, arrangements were made with the Nelson Stud Welding Division of Gregory Industries to prepare special 1-in. granular flux-filled welding studs, and to set up necessary Nelweld equipment. The Nelson equipment was operated by workmen with no prior experience with the process.

Using the Nelweld method, the output per man was raised substantially. Even more significant was the reduction in weld failures. Since the Nelweld process is basically arc welding, a good electrical ground is important. This was difficult to achieve on the anchor bolts, which ranged in length from 24 to 30 in., because they had at various times been coated with asphaltic paint and grout, traces of which remained along with some rust. To overcome this condition, a special fixture was designed.

Special Grounding Fixture

The steel fixture that was used had a 1⅛-in. central hole that allowed it to be slipped over the weld fillet after the weld was completed. It included a set screw, which, when tightened, locked the fixture in place. Turning of the set-screw point as it was tightened in-

3 WELD IS MADE by pulling trigger of welding gun after grounding device, ferrules and stud are positioned.

4 WITH ANCHOR BOLTS extended, leveling nuts and reinforcing in place, installation is ready for grouting.

Crane Rails

sured penetration through rust, paint or concrete, and the establishment of a good ground. Locking pliers, permanently attached to the gun ground cable, were fastened to the vertical fin of each fixture prior to welding the stud.

A feature of all end welding by the Nelweld process is the control of the molten metal flow and the arc flash through use of an expendable porcelain ferrule that surrounds the weld area. In applications such as this, where a stud is welded to something having the same diameter as the stud, two ferrules are used. The bottom of each ferrule has a saw-tooth configuration.

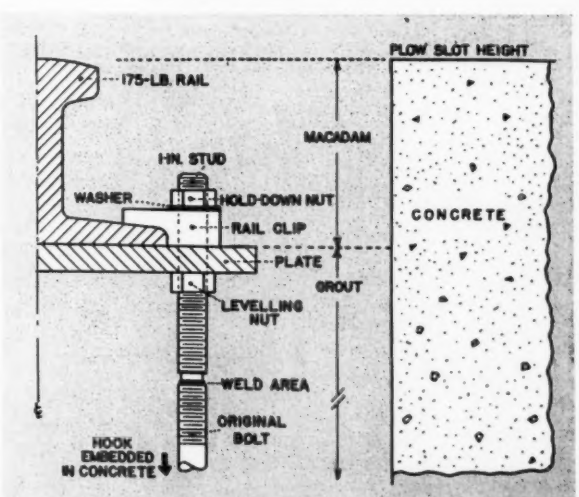
In this bolt-extension program, one ferrule was held in the teeth-upward position by the grounding fixture, and the other, teeth downward, was held with the stud in the Nelweld gun in the usual manner. As the gun was placed in welding position over the original anchor bolt, the saw teeth meshed and insured proper positioning of the ferrules.

Power for welding these unusually large diameter studs was furnished by three Nelwelder power units operated in parallel. These, together with the Nelson time-cycle control unit, were mounted on a trailer for mobility.

Work Procedure

A two-man crew performed the following steps: (1) Marked anchor bolts with chalkline to indicate cut-off point; (2) cut off bolts with an oxyacetylene torch; (3) ground the top surfaces of the bolts to remove all traces of melted and oxidized metal resulting from the torch cut; (4) secured the grounding fixture in position on each bolt; (5) placed the bottom porcelain ferrule on the fixture; (6) loaded the Nelweld gun with the stud and the top ferrule; and (7) pressed the trigger to complete the weld.

5 ON COMPLETION OF RAIL LAYING the trough between rail and curb is filled with macadam.



DETAILS OF FASTENING construction shows how the stud was extended and how rail is held at level.

A "ROUNDUP" of industrial power equipment was held recently by the International Harvester Company on its 4,200 acre Phoenix (Ariz.) Proving Grounds. The equipment show was attended by more than 600 International Industrial Power distributors from the U.S. and 24 foreign countries. The three-day affair was divided into a different type of activity each day. The opening day's show took the form of a parade of the company's entire line of earthmoving and materials handling machines, including units produced by the Frank G. Hough Company, a subsidiary. On the second day, actual demonstrations of each type of equipment shown the previous day were conducted on ten sites scattered throughout the grounds. Busses were used to transport the distributors around the area. An elaborate radio network was used to maintain the tight timetable of events and control operations over the 6½ sq mi area. On the final day, the morning program was composed of a demonstration of new International rubber-tired, two-wheeled tractors, and the afternoon was occupied with talks delivered by various department heads.

News Briefs in Pictures . . .

SOO LINE'S STATION at Neenah, Wis., is representative of contemporary design. The low lines, stone exterior facing, wide overhanging eaves, and the liberal use of glass give this structure a resemblance to the modern ranch-style home.

COMMITTEE 5, TRACK, of the AREA was treated to an inspection trip of the Terminal Railroad Association of St. Louis on May 11. A special train consisting of two coaches and two flat cars transported the group over the property.

WHAT'S THE ANSWER? . . .

. . . a forum on track, bridge, building and water service problems

Stockpiling Ballast on Line

What are the advantages, if any, in stockpiling ballast on line and subsequently rehandling it to the final location in track? Disadvantages? Explain.

Under Special Conditions Only

By R. H. Beeder

Assistant Chief Engineer,
Santa Fe System, Chicago

Ordinarily, the stockpiling of ballast on line, with subsequent rehandling to its final location in track, is a procedure loaded with the disadvantages of higher unit costs. No favorable consideration should be given to this method except under special conditions.

On a few occasions, where circumstances demanded such handling, we have stockpiled ballast from outside sources of supply in order to provide a continuous and uniform supply of ballast to surfacing gangs engaged in a large program. Most of these stockpiles have contained 100,000 to 200,000 cu yd of ballast that cost us a total of about 25 cents per cu yd for unloading during the winter months and reloading during the working season.

Some of the advantages that would obtain in a program of ballast stockpiling would be:

(1) Permits carrying on a surfacing program with a small supply of ballast cars, as the stockpiles can be centrally located within certain program limits for quick turnaround of ballast cars during the working season and more extensive use of ballast cars during the off season when these cars would normally be idle.

(2) Promotes a more uniform supply of ballast to extra gangs, thereby eliminating some of the delays arising from failure to receive ballast for surfacing work in the proper quantities at the right time.

(3) In some cases ballast can be secured during the off season from outside producers at a somewhat lower cost.

The big disadvantage of stockpiling ballast is, of course, the extra cost in unloading and reloading the ballast for its final handling to the gangs on a surfacing program. The overhead costs in this connection are of primary consideration and usually eliminate anything but fairly large stockpiles that go hand-in-hand with large programs. In many cases these overhead costs would include the expense for constructing temporary trackage and the setting up of a separate temporary organization for handling the work.

Another disadvantage can be the weather conditions generally encountered during the off season or winter months that can raise the unit costs of stockpiling considerably. Anyone who has faced the task of unloading a train load of ballast that has frozen in the cars knows how expensive this operation can be and knows how long these cars had to remain in a roundhouse before they were thawed sufficiently to permit unloading. Roundhouses are pretty scarce in this day and time, and to handle ballast frozen in cars, separate steam generating or similar facilities would have to be set up, all of which would add to the expense.

Should Be Avoided

By H. J. Fast

Engineer Maintenance of Way,
Canadian National, Toronto, Ont.

There are obviously two objections to stockpiling ballast on the line for subsequent distribution. These objections are inventory and double handling costs. On this region, we found from experience that we had to stockpile ballast to offset a long haul which was more expensive than inventory and double handling costs.

Along our northern lines we have enjoyed, in the past, a number of gravel pits with good quality ballast located at suitable intervals for economical distribution. Some of these pits have now been exhausted. We have, however, located other pits where the material

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the September Issue

1. What measures may be taken to reduce the rate of wear on the points of spring switches due to trailing point movements? Explain.

2. What causes paint to "alligator?" How can this be avoided? Explain.

3. To what extent, if any, has the introduction of diesel-operated trains increased or decreased the necessity of burning weeds on the right of way? Explain.

4. Where steel H-piles are used in bridge substructures under what conditions is it necessary to protect them with concrete encasement? Explain.

5. Do independent fastenings in tie plates have greater or less gage-holding power than ordinary track spikes? Why? How much?

6. When should corrosion-inhibiting chemicals be added to the water used in diesel engine-cooling systems. Why?

is of good quality but the size is not suitable for ballasting. Some of these pits have up to 40 per cent boulders in excess of the size which can be applied under the ties. We are, therefore, crushing pit-run ballast at three locations and stockpiling the crushed material for use as and when required.

Before we began crushing this material, we were forced to load, haul and unload the oversize material which had to be wasted on the shoulders of the embankment since the boulders were too large to apply under the ties. The cost of wasting this material was greater than the cost of crushing and stockpiling, including inventory cost. Further, the cost of hauling suitable material from other pits where the material did not have to be crushed was greater than crushing and stockpiling.

Our high-speed, heavy-tonnage lines are located in industrial areas where we use crushed rock and slag for ballast. In these locations we have a sufficient number of commercial pits located adjacent to our lines and we buy ballast direct from quarry operators. Hence, it is not necessary to stockpile ballast in these areas.

Our annual consumption of all classes of ballast on this region is approximately 750,000 cu yd. On the average our cost is below 60 cents a cu yd for crushed pit-run gravel and $1.25 a cu yd for crushed rock from commercial pits; all f.o.b. loaded in cars. Should this price increase materially on account of commercial pits closing down and railway pits becoming exhausted, we would of course try to locate additional pits and quarries to crush and stockpile ballast.

Whenever it is possible to correlate crushing operations with ballasting we load directly into ballast cars from the crusher and thus save the expense of double handling.

Balance All Factors

By R. V. Dangremond

Roadmaster,
Elgin, Joliet & Eastern,
Gary, Ind.

The answer to this question depends partially upon the location of the source of ballast with respect to the point of final application. There would be an advantage in stockpiling ballast on line when delivery dates are not dependable, due to long-distance shipping, however the cost of rehandling the material must be weighed against the trouble and loss due to uncertain delivery. It might easily be less costly on some roads to stockpile and rehandle than to be faced with the cost of revamping a surfacing or ballasting program on account of delay in delivery of material.

Where ballast sources are located so that reliable delivery can be depended upon, the added cost of stockpiling for normal use would obviously not be warranted.

Many roads are faced with the problem of providing emergency ballast supplies due to seasonal or periodic washouts, floods or for other reasons at more or less known locations. In these instances, it is a definite advantage to have emergency stockpiles of ballast located reasonably near these points. In such cases the size of the stockpiles would be relatively small and should not seriously raise M/W inventories. The material would also be on hand when most needed, thereby reducing serious delays to a minimum.

On some railroads, particularly those short-line roads located in industrial districts where ballast is readily available, it is not necessary to stockpile for emergency use nor is the cost of subsequent rehandling warranted.

Certain types of ballast, such as engine or powerhouse cinders, that are becoming scarce in some localities, might well be stockpiled if a good source can be found which will assure the availability of the material, when required, either for normal ballasting and surfacing programs or for emergency use. In these cases the locations of the stockpiles should be near the points of proposed use or at a centrally located point where loading equipment is readily available when needed.

Those roads that have non-revenue ballast cars or "company material" cars can eliminate the necessity of subsequent rehandling of ballast that normally would have to be stockpiled by holding some of these cars under load until the ballast is needed, or at least order the material well in advance to be sure that it is available when required without the expense of holding revenue cars under load.

Incidentally, when stockpiling cinders, care should be taken to see that the material is compacted properly in order to prevent internal combustion fires resulting from residual volatile materials. These fires are often hard to extinguish in large stockpiles and might result in complete destruction of the cinders so they are not fit for use as ballast.

Condemns Practice

By Herbert J. Crannan, Jr.

Foreman (track),
New York City Transit Authority,
Brooklyn, N. Y.

The essential advantage of any type of stockpiling is that it provides a ready supply of critical material in the event of unexpected shortages. These shortages include lack of the material resulting from such emergencies as wars, labor disputes, and unusual consumer demand. Some margin for error must also be allowed the track supervisor in his estimates of the required amount of material needed on any division for any planned interval of time.

Stockpiling in any form is only a necessary evil at best. The minimum amount of ballast to take care of emergencies and expedite routine work, as established by previous experience and past records, should be so stored. Stockpiling should be confined to those storage yards which are adequate for the purpose. There it will remain under store's inventories, protected against loss, misuse or unauthorized withdrawal until actually used. Most store yards are suitably located so that either work trains or trucks can be used in delivery. Yards, moreover, are equipped to do ballast loading in the most efficient and economical fashion.

Ballast stockpiling on line is conducive to waste. Even when stored on hard ground a certain amount of ballast will be lost due to settlement. Weathering will also cause "pile-scatter" and eventual loss. Normal policing of the line cannot be expected to prevent small but persistent losses due to petty thefts. Relatively unnoticeable and unimportant as these may seem, such losses have been known to cause the gradual, almost imperceptible, disappearance of even large stores of unprotected ballast.

Although the convenience of ballast stored along the line should encourage the section foreman to use it as needed this is not usually the case. Instead there is a tendency for the foreman to order ballast directly to the job as this is more to his advantage. Railroad capital tied up in stored ballast is unproductive, and should be kept to the barest minimum.

Stockpiling ballast on line does not seem to accomplish the few advantages claimed for it. It cannot be relied on to completely solve the supply problem during critical times and any salutary effects on track maintenance are questionable. Conversely it very often results in waste and added expense, increased problems of a policing and logistic nature and creates an untidy, unfinished roadway appearance.

Efficient Crews for Work Trains

Under the agreements now in effect with the train-service brotherhoods, what measures, if any, can M/W officers adopt to assure the assignment of efficient crews for work trains?

In Order of "Marking Up"

By C. W. Owens

Supervisor of Track,
Pennsylvania, Erie, Pa.

Because of the fact that crews for extra work trains come from the extra board in the order of "marking up and qualifications," and a regular work train must be advertised and awarded to the oldest qualified employees who request the job, the M/W officer has little if anything to say about the assignment of work train crews.

Under the agreements now in effect between the train and engine-service brotherhoods and the railroads, it is necessary for all M/W officers to be familiar with all of the regulations governing work-train operations in order to secure the most efficient service from these trains. These regulations include local agreements, such as working zones, yard limits, etc., as well as the "Rules for Conducting Transportation" and those operating rules contained in the current time-table and the supplements thereto. Conferences with the local trainmaster or assistant trainmaster over the scope of local agreements will often clarify those that are not clear to the M/W officer.

Since it is not always possible for the M/W officer to go out with each work train, and agreements with the local M/W brotherhoods frequently make it mandatory that a qualified track foreman be in charge of the work to be performed by the work train, it is necessary that a track foreman be instructed as to the moves he can or cannot make with a work train on his job. Thus, with a knowledge of what constitutes a penalty day and a thorough understanding of the "Rules for Conducting Transportation" a track foreman can successfully plan and make the most efficient use of a work train.

It sometimes becomes necessary to run a work train for three tricks a day, or around the clock, when cleaning ballast or grinding rail. Since the M/W officer cannot be with the train at all times under these conditions, a special-duty conductor might be assigned to arrange for relief of the crews and moving of the train from one location to another. However, this type of situation is very rare.

Uses Close Supervision

By B. S. Converse

Division Engineer,
Denver & Rio Grande Western,
Grand Junction, Colo.

Under existing agrements on this railroad is is not possible in any manner to select train crews. However, efficient performance of maintenance-of-way train service is obtained through close supervision by transportation officers. There are no departmental lines drawn in our organization, and transportation people are as interested in maintenance of way as in train operation. When necessary a trainmaster is on the ground to supervise crews.

Have Regular Crews Assigned

By E. V. Grogan

Supervisor of Track,
New York Central, New York

Under present agreements with train-service brotherhoods, there is not much that can be done about the assignment of work-train crews. However, there is much that can be done to increase the efficiency of such crews. It is considered advisable, where possible, to have regular crews assigned to work trains, the theory being that the crews will become better acquainted with the work to be performed and as a result will be more efficient.

In our locality, however, it is necessary to operate a work train six days per week before the job can be advertised for bid and a regular crew assigned. Maintenance forces do not work more than five days per week and to work the sixth day would result in punitive overtime for the work-train gang. It is also nearly impossible to get M/W employes to work six days per week. Therefore, after working with both regularly assigned crews and extra crews, I cannot see too much advantage in regular crews over crews from the extra list.

It is of the first importance to advise the train dispatcher, the first thing in the morning, where the work is to be performed during the day, the length of time required for each particular job, the general type of work at each location, and the track on which the work is to be done. When some special or unusual type of work is to be done, it is well to let the dispatcher know the day before. Every effort should be made to keep within the allotted time at each location, and if it is necessary to use more time, or the nature of the work should suddenly change, the dispatcher should be notified so that he will be prepared for the change. It will be found that work trains will gain more cooperation and more working time if these precautions are faithfully observed.

Secondly, one must be sure that the train and engine crew have a clear understanding of the work to be performed. It will be found that train crews are conscious of, and in sympathy with, the problems of track work and will, as a general rule, cooperate fully if given proper instructions. However, if inefficiency exists in their working instructions or in the work-train gang itself, and this is noted by train crews, the crew will lose interest in the work. The supervision in charge of work trains must be entirely familiar with the operation of trains in their respective territories in order that work can be planned with the least interference with traffic. Where work is to be performed at or near interlocking plants, we try to inform the director or operator of the plant just what we will endeavor to do.

In the third place, the work performed by a work train can be greatly increased if the work-train

foreman is kept advised by the supervision, several days in advance, of work that is planned or being planned. It is equally important to have a very thorough understanding with the work-train foreman concerning the exact location where the work is to be performed. Work trains cost considerable money to operate, and if material is not unloaded in the proper location, additional expense is incurred in relocating the material and time is lost from other work.

In conclusion, I believe it will be found that if a clear understanding of the work to be done is not had by all parties concerned the work will suffer. In late years, the operating department has been very willing to cooperate with the M/W forces, if reasonable requests are made for use of tracks. If it is determined that the work train has been unnecessarily delayed by the train dispatcher, yardmasters or train crews, the operating department, if advised concerning the facts, will issue instructions to the proper parties to prevent a recurrence.

Adequate Supervision Required

By George S. Crites

Division Engineer (Retired),
Baltimore & Ohio, Baltimore

The rules contained in agreements with the train-service brotherhoods are not universal in respect to details in all territories. There is no set and fast way to assure that efficient crews will be sent out on all work trains. The best method is to have the planning and dispatching of work trains done by the most competent and far-seeing supervision that is available and by fully using this supervision to get the most competent and interested crews that may be available.

In large terminals, in which, and out of which, many work trains may be dispatched, a trainmaster, who has been promoted from a road foreman of engines, can usually be safely assigned the specific duties of crewing and supervising work-train service. He reports to, and gets his orders from, the M/W officer in charge. If this trainmaster is of the right caliber, efficient crews will be assigned and he will check their performances in the yard or on the road.

Where emergencies or heavy construction work call for extensive work-train service, it is usually found economical and trouble-saving to assign a trainmaster and a road foreman to supervise work-train operations. Their work requires them to deliver all materials and forces to the points needed, when needed, and to see that competent train crews handle the work. Some work may be important enough to require the assignment of an assistant superintendent to the job and to coordinate his activities to the requirements of the M/W officer in charge.

At times, an assistant engineer, who is capable of developing into an executive, can handle the manning and dispatching of important work train service both expeditiously and economically by working with the transportation officers and possibly with the officers of the train-service brotherhoods. There will be barriers for such an engineer to overcome but he will either make or break himself on such a job. In the past, some railroad presidents "broke in" on such jobs.

On long branch lines in remote locations the right roadmaster or supervisor can also be titled a trainmaster. This helps a lot in securing efficient crews for work-train service. Here again, superintendents and executives might be groomed if the right material is used for such jobs.

In isolated locations, where work trains may be away from their home terminals for some days, it is best to provide good sleeping and boarding accommodations. These facilities, if advertised, usually induce competent and interested crews to bid for work train service.

Since all agreements with train-service brotherhoods must be observed to the letter, transportation officers familiar with all phases of these working rules must be consulted and the cooperation of the brotherhood officers should be sought when any extensive work-train service is planned for. If this is done, there is a reasonable chance that this service will be efficiently manned and no complaints or claims will be filed by the brotherhoods after the service has been performed.

Freighthouse Floors

Modern types of mechanical equipment for handling merchandise have imposed severe conditions of loading and wear on freighthouse floors. What changes can be made in floors of existing structures to minimize the effects of this equipment? Explain.

Install Concrete Floors

By J. W. Hayes

Architect,
Great Northern, St. Paul, Minn.

In handling this problem deteriorated wood floors can be replaced with reinforced-concrete floors, approximately 5 in thick, on thoroughly compacted sand fills. Old concrete floors, with badly deteriorated surfaces, can be resurfaced and patched quickly and economically by the application of two prime coats of black semi-liquid material, such as Masticrete primer, with a stiff brush, after the old surface has been thoroughly cleaned of dirt, dust, grease, oil and paint. The first prime coat should be allowed to dry thoroughly before the second coat is applied. The top coat of aggregate is then applied. This coat is composed of one part—by volume not weight—Portland cement, 2 parts clean sharp sand, 3 parts stone or gravel not over ¼ in. in size, and two parts Masticrete. The amount of mixing water required will vary according to the condition of the sand and gravel. Usually one part of water is sufficient. If, however, the sand and gravel are exceptionally dry, more water should be used. The above is recommended for surfaces which are subjected to heavy rolling traffic from steel or rubber-tired trucks.

For repairs to surfaces subject to foot traffic, such as sidewalks, stair treads, and washrooms, the aggregate should be composed of one part Portland cement, four parts clean sharp sand, and two parts Masticrete.

Holes over 2 in deep can be repaired by the application of a grout mixture and the "crowning" of this mixture to allow for shrinkage and compaction.

Timber, Steel or Concrete Piles?

What economic factors affect the choice of timber, steel or concrete piles for the construction of railway trestles? Explain.

Judgment a Basic Factor

By J. S. Hancock

Bridge Engineer,
Detroit, Toledo & Ironton,
Dearborn, Mich.

The economic factors that affect the choice of timber, steel or concrete piles for the construction of railway trestles should include the cost of construction, including the expense of maintaining traffic during construction, estimated service life, interest value of the investment and estimated annual cost of maintenance and operation. Due consideration should also be given to fire, flood, ice and drift hazards, and the possibility of future line revisions or abandonment and the effect of the expenditure on taxes.

One will find that, after making a study of the economic factors, the resulting figures are based on estimates and assumptions and the decision is influenced by many intangible items. In fact, each type pile has its advantages and disadvantages, and the type to use should be based on the type considered best for the location under consideration. The economic factors can be of assistance in reaching this decision. However, these factors are reliable only in proportion to the judgement used in interpreting them.

The wood pile, of sound material well creosoted so no sapwood is left untreated, well treated and well protected at the cut-off line and at all bolt holes, is an economical trestle piling. However, it is subject to damage by fire and will not sustain the load that a steel or concrete pile will carry. As commonly used in trestle construction, the close spacing of the bents can cause drift and ice to collect to the extent that this type construction is not desirable over streams carrying heavy drift or ice. The fact that there are very few wood-pile trestles on the main lines of several major railroads is sufficient evidence that economy is not always the most important consideration.

Steel "H" piles, when protected with concrete to an adequate distance below ground or water line, have a long life and lend themselves readily to trestle construction due to ease in handling and driving, and ease of splicing and of applying bracing and caps by welding. They are particularly advantageous where deep penetration is required to prevent undermining. They have the disadvantage that they "fetch up" on hard strata for good point bearing.

The concrete pile has a wide use in ballast-deck, concrete-trestle construction, particularly since the 24-in diameter pile was developed, permitting the use of three-pile-bent construction. These piles, when properly constructed and handled, will have a long life. They have the disadvantage of requiring heavy equipment for handling and driving and in some foundation materials require jetting or preboring to obtain sufficient penetration and are subject to deterioration in salt and alkali water.

The Monotube and steel-pipe pile are also being used for trestle construction and should not be overlooked in making a decision as to the best type of pile to be used for the work under consideration.

Spot-Tamping with Machines

To what extent is it practicable and economical to use on-track tampers for spot-tamping work? What procedure and organization will give the best results? Explain.

Both Practical and Economical

By J. P. Datesman

Engineer of Track,
Chicago & North Western, Chicago

There is no question that the use of on-track tampers for spot-tamping work is practicable and economical. It is essential, however, that a tamper which is capable of making very light lifts, ranging from ¼ in upward, be used. It is further required that the tamper have a split crosshead so that the machine can tamp under either rail or an entire tie.

It has been our experience that an organization composed of 9 or 10 men, using a tamping machine, can tamp between 167 and 201 joints in 5 hr working time. This number of joints represents 0.61 mi'es and 0.74 miles of track, respectively. We have used the following organization for this work:

1 machine operator.
1 foreman, doing the necessary raising.
1 level man.
1 jack man.
2 men tamping at the jack locations, before the jacks are removed.
2 men throwing in ballast, one on each side of the machine.
1 man dressing the track behind the machine.

With the above organization, no lining is carried out. If lining is necessary one assistant foreman and 4 to 5 men with track liners would be required in addition to the above force.

This same organization can be used behind large surfacing gangs to put the track in the proper riding condition after initial settlement has taken place. There is always a certain amount of settlement that occurs behind out-of-face surfacing, especially when raises of from 5 to 6 in are made.

This organization can be used on track that has been surfaced for two or three years, where the ballast is still fairly clean, to improve riding conditions. Of course most of the work involved is at the joints. We have found it was necessary to tamp approximately six ties at each joint location. There will probably be other ties at odd locations in addition to the joint ties that should be tamped. All of the ties that need tamping are marked by the foreman ahead of the on-track tamper, so that the machine operator will know exactly where to work.

If the spot-surfacing work is carried out under traffic, the on-track time for the machine will, of course, be controlled by the traffic density. In heavy-traffic territories we have found that we can average between 4 and 5 hr per day on the track, as the tamping machines can be easily removed in a matter of 2 or 3 min to clear passing trains.

If the work is carried out on "dead" track, a great deal more work would be secured from an organization such as mentioned above, and it would be possible to spot surface a mile or more of track per day.

Controlling Spillage Of Diesel Fuel

What practicable measures can be taken at diesel fueling stations to control the spillage of diesel fuel? Explain.

Three Phases of Control

By M. A. Hanson

Engineer of Research,
Gulf, Mobile & Ohio,
Bloomington, Ill.

There are three distinct phases to the control of fuel oil spillage at diesel fueling stations. These stations must be adequately engineered, they must have satisfactory maintenance, and they must be properly operated.

Proper engineering will include an overhead rack to permit the unloading of tank cars through the dome, and a fuel pump equipped with adequate seals so that it will remain leak-free under a positive head. This fuel pump should also be equipped with an internal bypass designed to limit the discharge pressure.

Each standpipe should be equipped with a gate valve installed at a convenient operating height. The discharge end of each hose should be equipped with a trigger operated hose-nozzle valve. These nozzle valves should be further equipped with a quick coupling union and the necessary adapter fittings required to couple these unions to locomotive fuel tank openings of various sizes. Switches to start and stop the fuel pump should also be conveniently located.

The routine maintenance of the facilities and locomotive fuel tank fittings should be such as will assure that all connectors, fittings and valves remain leak-free. This will require an occasional gasket renewal in the quick-coupling arrangement, renewal of hoses which may have been damaged, and repairs to adapters primarily due to mechanical damage.

The fuel pump should only be run during the time fueling is actually taking place. Allowing the pump to run for extended periods of time, bypassing fuel will overheat the pump and tend to cause seal leakage. The gate valves on all standpipes should be closed except when fueling a locomotive and then only the gate valves on the standpipes being used should be open. The flow of fuel should be controlled by the trigger valve at the end of each fuel hose.

It has been our experience that, with these precautions, little if any fuel is spilled at the fuel stations.

What Our Readers Think

A Section Foreman's Wife Speaks Out

To the Editor:

I have read with interest your editorial ("Solving the Foreman Problem," February, p. 39) and succeeding articles in *Railway Track and Structures* concerning the lot of the section foreman. As the wife of a section foreman with eighteen years seniority, perhaps you might care to hear what I think and feel on the subject. I am sure my views are the same as other women whose husbands follow such work.

My husband came to his present section sixteen years ago. At the time, we both felt it would be temporary, a stop-gap, then perhaps he would get a promotion or a better section, or go on to higher goals in railroading. He studied railroad engineering from the International Correspondence School to prepare himself for that goal. He had a fine tradition for railroading behind him. His father was a roadmaster and his grandfather helped build the Missouri Pacific.

His promotion came up, and he was by-passed by men with less knowledge of the work involved, less education, less seniority, less sense of responsibility. I have seen him lose his enthusiasm and interest, and become more and more discouraged. I have seen an attitude of "why should I work my fool head off for an outfit that doesn't care."

When new wage agreements go into effect, the foreman gets very little recognition. We have a fine family, but wages are not high enough to give them the things they should have. My husband's discouragement is conveyed to and reflected in the family. Occasionally we have our hopes raised, only to have them crash.

He would like to leave his type of work, but feels he will lose so much—seniority, retirement benefits, etc. We have three boys, who talk about going into railroad work some day. But we will discourage them in every way possible, because, as the section foreman's job stands as of today, it is the least desirous, most discouraging, poorest paid job a man can choose.

I look forward to the day, which I hope will not be too far in the future, when my husband will receive recognition, better pay and working conditions; when his old enthusiasm and interest return; when he will be glad to see his sons carry on the railroad tradition.

A Wife

Using Secondhand Ties

Paris, France

To the Editor:

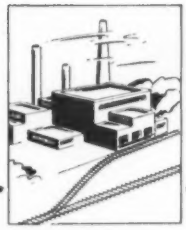
French practice is to renew all ties of a given section of track at the same time. Removed ties are sent to a special railroad workshop where they are classified and reconditioned if they are considered worth it. Reconditioning is done by readzing, plugging holes and boring new screw-spike holes. Screw-spike holes are prebored completely through the tie to prevent water pockets and retention of water in the hole.

Before the practice was adopted of renewing all ties in a given section a long time ago, ties were renewed one at a time as required. This practice cost too much for labor and the track tamping was uneven. Reconditioning of the recovered ties was also expensive.

According to present practice, ties installed at any given location are in about the same condition—new or secondhand. A rather long period of time will therefore pass without the necessity of any renewals. As a matter of fact, a secondary track, even though tied with secondhand ties in poor condition, will remain in good surface until such time as all of the ties are scrapped, provided spot renewals of ties are not made.

Henri Girod-Eymery
Président Directeur Général
Société d'Etudes Ferroviaires

[This letter was submitted as a reply to a question on the use of second-hand ties, which was posed by our "What's the Answer" department. Mr. Girod-Eymery's contribution was received too late to be included with the other answers which were published in the January 1954 issue.—Editor]



PRODUCTS OF MANUFACTURERS . . .

. . . new, improved equipment, materials, devices

RUBBER-TIRED LOADER

A NEW 4-wheel-drive, rubber-tired loader with a 1-yd bucket has been announced by the Tractomotive Corporation, Deerfield, Ill. It is the model TL-12 Tracto-Loader and is reported to be adaptable for many stockpiling, excavating and backfilling operations. The 12,000-lb unit is equipped with 4-wheel drive, rear wheel power steering, a clutch-type transmission with four speeds in each direction, and a torque converter drive with a three-to-one torque multiplication ratio.

The clutch-type transmission allows the operator to change from forward to reverse by pulling one lever; no gear shifting is necessary. The torque converter is designed to give the loader a steady flow of power to all four wheels and eliminates clutching during the loading operation. The manufacturer claims that the converter practically eliminates wheel slippage and allows the operator to maneuver better in close quarters since the machine can be slowed down to creeping speed without slipping the clutch.

The TL-12 has a ground clearance of 15 in, a 62½-in tread on both front and rear wheels and an overall width of 86 in. The rear wheels track directly behind the front wheels, thereby, it is reported, reducing the effort required when traveling over loose or soft material.

The clearance under the bucket cutting edge, when it is dumped at maximum raise, is 8 ft. However, the machine will dump into a truck with sideboards 9 ft 8 in high if the bucket is retracted before backing away from the truck. In addition a bucket reach is provided which permits the machine to dump its load in the center of the truck bed without difficulty.

The dump cylinders are double-acting for controlled dumping and quick return of the bucket. The lift cylinders are double-acting for down pressure and for quick return to ground level. Electric starter, electric fuel pump, lights, horn, oil bath air cleaner, pre-cleaner, oil filter, muffler, drawbar, hydraulic brakes, parking brakes and power steering are standard equipment on the TL-12.

COMPLETELY NEW SHOVEL-CRANE

A HEAVY-DUTY shovel-crane which is said to bridge the gap between the application and portability advantages of machines up to ¾ yd and the ouput of the larger and heavier machines has been announced by the Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

The new machine, designated the Model LS-98, is a 1-yd unit and is equipped with "Speed-o-Matic," a complete power hydraulic control system. The crawler-mounted unit weighs 53,000 lb as a shovel, which, it is claimed, is low for a machine of its capacity.

Mechanical features of the LS-98 include: power steering and two-speed travel gear, self-cleaning track system, self-adjusting clutch to offset heat and normal lining wear and power load lowering for either or both front and rear drums. In addition, rollers are conical hook type on tapered roller bearings; bearing at all vital points are anti-friction; splined shafting is used throughout; and there is independent chain crowding for shovel operation plus a full revolving fairleader that reduces cable wear during dragline operation. Also included as standard equipment are extender cables for dragline and crane booms, and a patented retractable gantry which can be raised and lowered by means of the power unit.

Operational features of the unit include control of digging brakes and traveling, steering and digging functions from the operator's position in the cab. Ground clearance is 14 in and all lower frame machinery is fully enclosed. A cab-top window is provided for improved visibility and, as optional equipment, independent swing and travel is offered.

(*Please turn to page* 66)

"... Very Satisfactory ... A Nice Saving"

Roy H. Gilkey, Division Engineer of Central of Georgia Railway Company, is a past President of the Roadmasters' and Maintenance of Way Association of America.

Form 204

CENTRAL OF GEORGIA RAILWAY COMPANY

Savannah, Georgia-m
March 4, 1954
Lubricators

Mr. H. T. Armstrong, Manager,
Railroad Sales,
H. T. Kennedy Company, Inc.,
37 Wall Street,
New York 5, New York.

Dear Holly:-

We installed the Aladdin Rail and Wheel Flange Lubricator at Millen, Georgia, during April 1953. This lubricator was installed on a busy lead and has proved very satisfactory, carrying grease each way through switch points and over frogs.

One of the fine features is that no wheels make contact with any part of the lubricator. This lubricator can be installed very easily by one man, and will fit all types of rail. Another good feature is that the grease is carried along the side of the rail head and not deposited on the top of the rail. It has shown a nice saving on the wear of switch points and frogs.

Care must be taken to see that the correct grease is used, and that the lubricator is kept clean and in adjustment at all times.

Sincerely yours,
Roy H. Gilkey.
Roy H. Gilkey,
Division Engineer.

The Central of Georgia Railway Company is still another important railroad now using the

ALADDIN LUBRICATOR

Experienced railroad men value its economy, convenience and simplicity.

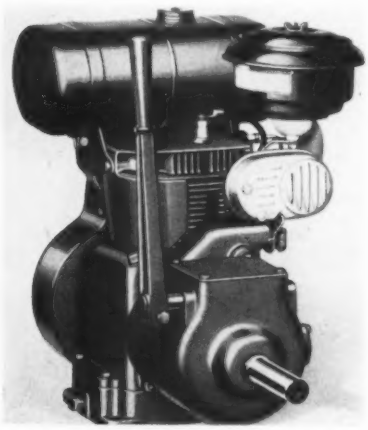
The ALADDIN Lubricator is a self-contained valveless *grease* pump. It fits any rail — cuts maintenance on curves, frogs and switches.

Order an ALADDIN Lubricator for *your* road. Try it. Test it and you will join the increasing number of railroads adopting the ALADDIN as standard equipment. Only $178.00 delivered.

H. T. KENNEDY COMPANY, INC., 37 Wall St., New York 5, N.Y.

AIR-COOLED ENGINE

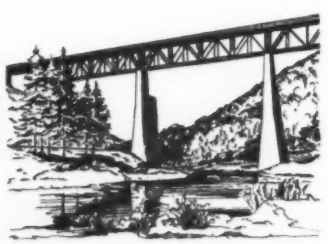
A HAND CLUTCH which has been engineered into its new model K160 air-cooled engine, and to be known as model K160C, has been announced by the Kohler Company, Kohler, Wis. This model, a



single-cylinder, 4-cycle engine, equipped with oil bath air cleaner, ball bearings, oil bathed fly-ball governor, fuel fitter, silencer muffler and 1¼-gal. fuel tank, is said to provide 6.6-hp at 3600 rpm, 6.3-hp at 3000 rpm, 5.1-hp at 2400 rpm, and 3.7-hp at 1800 rpm, respectively.

COMPRESSION HYDRANT

A NON-FREEZING, compression hydrant, which has been redesigned for use on installations where water is needed quickly in all kinds of weather, has been announced by the Murdock Manufacturing & Supply Co., Cincinnati, Ohio. Known as the "Murdock, Jr.," the new ¾-in hydrant is made of grade A bronze and grey iron castings. Water flow is controlled by a large ball wheel handle on top, or a lever is available, if desired.



THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

Changes in Railway Personnel

General

W. Jerome Strout, general manager—operations of the Bangor & Aroostook, and an engineer through education and experience, has been elected vice-president—operations and maintenance at Bangor, Me.

B. Whiticar, roadmaster for the Canadian Pacific at Winnipeg, has been appointed assistant superintendent, at Prince Albert, Man.

Engineering

M. I. Dunn, assistant vice president-construction and maintenance of the Chesapeake & Ohio, has been promoted to vice-president-construction and maintenance, succeeding **C. J. Geyer,** who has retired after 46 years of service.

E. H. McGovern, engineer maintenance of way for the New York Central at Cincinnati, Ohio, has been transferred to Indianapolis, Ind. **G. S. Wooding,** assistant division engineer at Albany, N. Y., has been promoted to division engineer at Erie, Pa., to succeed **C. C. Herrick,** who has been appointed division engineer at Cleveland, Ohio, to replace **L. W. Moss,** who has been transferred to Mt. Carmel, Ill. **Fred Hess,** assistant chief engineer, has been appointed district engineer for the Big Four district at Indianapolis, Ind.

T. T. Burgess, draftsman for the Santa Fe at Topeka, Kan., has been promoted to assistant engineer at that point.

J. H. Sawyer, assistant chief engineer for the Chicago Great Western at Oelwein, Iowa, has been promoted to chief engineer, succeeding **H. W. Johnson,** who has been named assistant vice-president and assistant general manager.

A. E. MacMillan, formerly assistant engineer for the Chicago Great Western at Oelwein, Iowa, has been named project engineer for the Boston & Maine at Boston, Mass.

Randell H. Egbert has been named chief engineer for the Toledo, Peoria & Western, and **Robert J. Dunn,** general roadmaster, has been named engineer-maintenance of way, replacing Mr. Egbert.

John W. Kidd, assistant superintendent of the Southern at Knoxville, Tenn., and formerly division engineer at Louisville, Ky., has been appointed assistant chief engineer, maintenance of way and structures, Eastern lines, with headquarters at Charlotte, N. C., to succeed **G. Page Asbury,** who has retired after more than 40 years of service. **M. French Akers,** division engineer at Knoxville, has been appointed assistant superintendent to replace Mr. Kidd. **R. A. M. Deat,** division engineer, has been transferred from Charleston, S. C. to Richmond, Va.

R. B. Hayslip, supervisor of track on the Chesapeake & Ohio, has been promoted to assistant division engineer at Clifton Forge, Va.

H. D. Sipe, assistant division engineer of the Fort Wayne division of the Pennsylvania, has been transferred to the Lake division.

G. R. Brooks, student engineer on the Seaboard Air Line, has been promoted to assistant to the division engineer with headquarters as before at Raleigh, N. C., to succeed **H. E. Richardson,** who has been advanced to assistant division engineer at that location.

Mr. Richardson was graduated from North Carolina State College in June 1950 with a civil engineering degree. He has since served as assistant to the division engineer at Raleigh with the exception of six months service in the Army.

H. L. Purdy, junior assistant engineer on the Moncton division of the Canadian National, has been promoted to assistant division engineer with headquarters as before at Moncton, N. B.

Mr. Purdy was born at Millidgeville, N. B., and is a graduate engineer of the University of New Brunswick. He joined the CNR in 1950 as an instrumentman in the engineering department at Moncton. In 1951 he was transferred to New Glasgow, N. B., and was made junior assistant engineer there in 1952. He returned to Moncton in 1953 in the same capacity, which position he held at the time of his recent promotion.

John E. Hoving, assistant to chief engineer for the Northern Pacific, has been promoted to assistant chief engineer, succeeding **James T. Derrig,** who has retired.

Mr. Hoving, a native of Fergus Falls, Minn., and a graduate of the University of Minnesota, began service with the Northern Pacific as assistant engineer of track, at St. Paul. He later held the positions of assistant engineer at Fargo and Duluth, office engineer, principal assistant engineer, district engineer and special engineer to the president—all at St. Paul. In February, 1952, he was appointed assistant to chief engineer in charge of reconstruction of the Columbia River bridge at Pasco, Wash.

Mr. Derrig began service with the Northern Pacific as a chainman in 1910 and later held the positions of district engineer and assistant to the chief engineer at St. Paul. In 1944 he was assistant appointed chief engineer, at Seattle.

K. W. Schoeneberg, roadmaster for the Frisco at Amory, Miss., has been appointed assistant division engineer at Chaffee, Mo., succeeding **O. E. Fort,**

who has been appointed division engineer at Ft. Worth, Tex., succeeding **T. E. Bliss,** who has retired.

Mr. Schoeneberg was born at St. Louis, Mo., on November 5, 1921. He attended the Missouri School of Mines from 1940 through 1944 and received a B.S. degree in civil engineering. After service in the armed forces, he returned to the School of Mines in 1947 and obtained an M.S. degree. He began service with the Frisco in March, 1948, as a student apprentice in the maintenance-of-way department

K. W. Schoeneberg

and served as such until he was appointed assistant roadmaster at Sherman, Tex. in March, 1950. In August, 1950, he was promoted to roadmaster at Amory, Miss. and served there until his promotion.

Mr. Bliss was born in Oskaloosa, Kan., and after attending the University of Kansas joined the Frisco Railway in 1909 as a rodman. While attending col-

T. E. Bliss

lege Mr. Bliss had also gained some railway experience through part-time work with the Santa Fe in various engineering positions. Later in 1909 he was made transitman for the Frisco and served in this capacity and as a draftsman until 1914 when he was appointed assistant engineer. He served as such at various points throughout the system until August, 1918, when he was appointed district engineer. In April, 1919, he was again appointed assistant engineer and served until he was appointed division engineer in 1920. Later that same year

he returned to the position of assistant engineer in which he served at various points until 1926 at which time he was appointed division engineer.

G. V. Guerin, bridge engineer for the Great Northern, with headquarters at St. Paul, Minn., has been promoted to assistant chief engineer at Seattle, Wash., replacing **H. M. Goehring** who has retired. **R. W. Gustafson,** assistant bridge engineer at Seattle, has been promoted to bridge engineer at St. Paul to succeed

G. V. Guerin

Mr. Guerin. **C. D. Archibald,** assistant engineer at St. Paul, has become assistant bridge engineer succeeding Mr. Gustafson.

Mr. Goehring is retiring after more than 40 years of service with the Great Northern where he started as an engineering instrumentman at Winnipeg, Man., in 1914. In 1916 he became assistant engineer of the Mesabi division, and was appointed assistant water service engineer at St. Paul in 1917. In 1940 he became office engineer at St. Paul, and

H. M. Goehring

was made assistant chief engineer at Seattle in 1946.

Mr. Guerin began his service with the Great Northern as a draftsman at St. Paul in 1924. In 1926 he became inspector of creosote products, and was appointed assistant bridge engineer for the Eastern Lines in 1929. He was promoted to bridge engineer in 1940, the position he was holding at the time of his recent promotion.

Mr. Gustafson began his railway service as a draftsman in St. Paul in 1924, and later served as an inspector before being appointed assistant engineer for the Western Lines in 1929, at Spokane, Wash. He later held the same position at Great Falls, Mont., from 1931 to 1937 and at St. Paul from 1937 to 1940 when he was named assistant bridge engineer at Seattle.

All of Mr. Archibald's service has been in the bridge engineering depart-

R. W. Gustafson

ment at St. Paul where he started as a draftsman in 1940, becoming inspector in 1946 and structural draftsman in 1947. In 1949 he was promoted to structural engineer and in 1950 to assistant engineer, the position he was holding at the time of the recent appointment.

J. D. Ferguson, whose promotion to assistant division engineer on the Chesapeake & Ohio at Hinton, W. Va., was announced recently (RT&S, March, p. 104), was born at Gretna, Va., on December 15, 1906, and received his civil engineering education at Virginia Polytechnic Institute. He entered the service of the C&O in June 1929 as a rodman at Clifton Forge, Va., where he later served as masonry inspector. He left the C&O in November 1935 to serve on various construction projects. On his return to the railway in November 1945, Mr. Ferguson was appointed draftsman at Clifton Forge, and in May 1947 was advanced to resident engineer at Hinton. Appointed assistant supervisor of bridges and buildings at Clifton Forge in January 1950, he served in that capacity until April 1953, when he was promoted to supervisor of bridges and buildings at Hinton—the position he held at the time of his recent appointment.

Thornton M. Mouring, who was recently appointed chief engineer of the Maryland & Pennsylvania at Baltimore, Md. (RT&S, March, p. 109), was born at Baltimore on November 28, 1919, and entered the service of the M&P as clerk-office boy on March 1, 1938. Thereafter he served as clerk in the general and local freight offices and in the engineering and accounting departments until December 1, 1942, when he became a bookkeeper in the accounting department. After a period of military service in the Pacific theatre, during which he attained the rank of first lieutenant of engineers, Mr. Mouring returned to the M&P in 1946 and assumed the position he had previously held. The following year he entered the engineering department as engineering assistant, and on January 1, 1950, was advanced to assistant to chief engineer. In March 1951 he was recalled to active duty with the U.S. Corps of Engineers and served in Germany until July 1952, when he returned to his former position on the railroad. During recent years Mr. Mouring has been attending evening sessions at Johns Hopkins University, from which he anticipates receiving a B.S. degree in civil engineering in the near future.

Walter R. Catching, Jr., whose promotion to assistant division engineer on the Philadelphia division of the Pennsylvania at Harrisburg, Pa., was announced recently (RT&S, April, p. 78), was born at Oakland, Calif., on October 10, 1918, and was graduated in civil engineering from Lehigh University in June 1940. He began railroad service with the PRR on July 1 of the latter year as an engineering apprentice at Williamsport, Pa., where he was subsequently appointed assistant on the engineering corps, in which capacity he was later transferred to Philadelphia and Norristown, Pa. Appointed assistant supervisor of track in January 1942, Mr. Catching held that position consecutively at Lock Haven, Pa., Downingtown, Pa., and Carnegie, Pa. In October 1943 he was furloughed for military service, in which he served two years in the ETO with the PRR-sponsored 717th Railway Operating Battalion, and with Headquarters 2d Military Railway Service. On his return to the PRR in April 1946, he was appointed supervisor of track on the Monongahela division at Homestead, Pa., and subsequently held that position on the Fort Wayne division at Crestline, Ohio, and on the Eastern division at Canton, Ohio, where he was serving when he received his recent promotion.

Fred C. Teske, Jr., who has been promoted to assistant to chief engineer for the Soo Line at Minneapolis (RT&S, May, p. 72), was born at St. Paul, Minn., February 28, 1905. He began his railroad career in 1923 with the Milwaukee Road on a part-time basis, and after completion of a college engineering course at the University of Minnesota in 1927, he joined the U. S. Army Engineer Corps. at St. Paul. Later that same year he joined the bridge department of the Northern Pacific at St. Paul as a draftsman and served in this capacity until June, 1930, when he received a fellowship for graduate study in transportation at Yale University. In June, 1930, Mr. Teske joined the Soo Line as a draftsman and designer in the bridge department and served in this capacity until 1933. From June, 1933, to April, 1936, he served as deputy assessor of real estate for the city of Minneapolis, after which he rejoined the Soo Line as a draftsman and designer, later serving as an inspector and engineer on field construction until 1937. He was then

(*Continued on page 70*)

Railway Personnel (cont'd)

appointed assistant roadmaster at Stevens Point, Wis. In January 1938 he was appointed assistant division engineer at Stevens Point and served there until October, 1939 when he was appointed assistant superintendent of construction projects, and area engineer for the WPA at Minneapolis. From October 1939 to December 1944 he served as an instructor in the college of engineering at the University of Minnesota and during summer vacations worked in the engineering department of the Soo Line. In 1944 he rejoined the Soo Line as assistant engineer in the B&B department and in 1945 was appointed division engineer for the Winnepeg division. Later that same year he was appointed assistant engineer, B&B department. He was later appointed chief draftsman and bridge designer in the engineering department and served in this capacity until his recent promotion.

Track

H. W. Cooper, extra gang foreman for the Frisco, has been promoted to roadmaster at Amory, Miss., replacing **K. W. Schoeneberg** whose promotion to assistant division engineer is noted elsewhere in these columns.

R. O. Nutt, assistant engineer for the Santa Fe at Galveston, Tex., has been promoted to roadmaster at Silsbee, Tex.

W. A. Nimmo, roadmaster on the Canadian Pacific at Estevan, Man., has been transferred to Winnipeg as roadmaster, succeeding **D. Whiticar** whose promotion to assistant superintendent is noted elsewhere in these columns. **O. Thompson,** roadmaster at Wilkie, has been transferred to Estevan to succeed Mr. Nimmo, and **John Patrick** of Grenfell has been promoted from assistant roadmaster to roadmaster, succeeding Mr. Thompson at Wilkie. **August Swanson,** roadmaster at Fort William, has retired after 46 years of service.

Milton L. Spangler has been promoted to general roadmaster for the Toledo, Peoria & Western.

Terence O'Brien, supervisor of track on the Southern at Orangeburg, S. C., has been transferred to Union, S. C.

F. D. McDowell, assistant roadmaster on the Jacksonville-Starke district of the Seaboard Air Line, has been promoted to roadmaster on the Monroe-Rutherfordton district, with headquarters at Monroe, N. C., to succeed **R. A. McCray,** who has been transferred to the Columbia-Savannah district with headquarters at Columbia, S. C., to replace the late **J. D. Coe.**

R. S. Coleman, assistant supervisor track on the Chesapeake & Ohio at St. Albans, W. Va., has been appointed supervisor of track at that same point, succeeding **R. B. Hayslip,** whose promotion to assistant division engineer is noted elsewhere in these columns.

H. A. Sirano, assistant supervisor of track on the New York division of the Pennsylvania at New York, has been promoted to supervisor of track on the Philadelphia division at Ernest, Pa. **J. P. Garrett,** junior engineer on the Southwestern division, has been advanced to assistant supervisor of track on the Chicago division at South Chicago, Ill., to succeed **W. K. Kearns,** who has been transferred to New York to replace Mr. Sirano. **J. M. Rankin,** supervisor in the office of engineer—tests, maintenance of way, Altoona Works, at Altoona, Pa., has been appointed supervisor of track on the Lake division at Ashtabula, Ohio, to succeed **R. P. Howell,** who has been appointed assistant supervisor of track on the Eastern division at Canton, Ohio.

Fred R. Hoke, whose promotion to supervisor of track on the Southern at Mooresville, N. C., was announced recently (RT&S, May, p. 78), was born at Granite Quarry, N. C., on November 4, 1924. He was first employed by the Southern in a clerical capacity at High Point, N. C., in July 1942. Entering military service in April 1943, he returned to the railway in July 1948 as a student engineer in the office of the chief engineer, maintenance of way and structures, at Charlotte, N. C., and served afterward as rodman at that location. In January 1952 Mr. Hoke was made a student apprentice at Greensboro, N. C., and became assistant supervisor of track there in December 1952, the position he held at the time of his recent promotion.

Bridge and Building

A. Hogue has been appointed bridge and building master on the Montreal Terminals division of the Canadian Pacific at Montreal, Que., to succeed **J. A. Rose,** who has been transferred to the Laurentian division.

D. H. McKibben, supervisor of structures on the Pennsylvania at Harrington, Del., has been transferred to Buffalo, N.Y., as supervisor structures, succeeding **H. S. Hildebrand,** deceased. **W. H. Pahl,** assistant supervisor structures at Indianapolis, Ind., has been promoted to supervisor structures at Harrington, replacing Mr. McKibben. **L. F. Lurcot,** junior engineer at Philadelphia, has been promoted to assistant supervisor structures succeeding Mr. Pahl.

G. R. Shay, senior structural engineer on the Frisco, has been appointed assistant bridge engineer at Springfield, Mo.

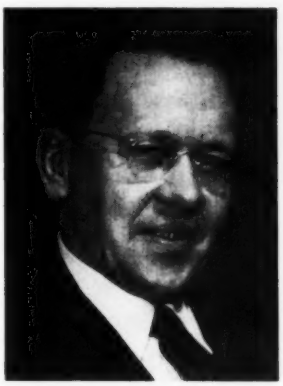
Water Service

Theodore Morris, engineer of water service on the Pennsylvania, has been promoted to manager of water service with headquarters as before at Philadelphia, Pa., to succeed **Joseph A. Russell,** who has retired after 40 years of service.

Special

C. F. Lewis, superintendent work equipment for the Santa Fe, has been transferred from Topeka, Kan., to Albuquerque, N. M.

C. Miles Burpee, who has been appointed secretary-manager of the Service Bureau, American Wood Preservers' Association (RT&S, May, p. 84), has been continuously identified with the railway field, both directly and indirectly through association with a supply company and the Simmons-Boardman railway publications, for 30 years. Mr. Burpee is a native of Edmundston, N. B., and attended the University of New Brunswick from which he received the degrees of Bachelor of Science and Master of Science in civil engineering. While going to college he worked during summer vacations with the Canadian National in various capacities including rodman and instrumentman. Later he spent several summers as a resident engineer on highway construction in New Brunswick. After graduating from college, Mr. Burpee served for a time as an instructor in surveying, descriptive geometry and mechanical drawing in the engineering school of Marquette University. In 1924 he returned to rail-



C. Miles Burpee

road service with the Delaware & Hudson, where he served as track supervisor, bridge and building supervisor, bridge and building master, purchasing engineer and research engineer. In the latter capacity his duties included the purchase and supervision of inspection of all forest products.

During 1937 Mr. Burpee served as vice-president in charge of the railroad division of the Chipman Chemical Company, while on leave of absence from the D&H, but returned to the road in the same year. In 1938 he resigned to join the Simmons-Boardman Publishing Corporation as managing editor of the Railway Engineering & Maintenance Cyclopedia. From 1943 to 1946 he served as purchasing and stores editor of the Railway Age, and for the last two years of this period he served also as editor of the RE&M Cyclopedia. During the final year of the same period, Mr. Burpee also held the title of executive assistant. In 1946 he was elected vice-president of the company, which position he held until his recent resignation.

Mr. Burpee is a past president of the American Railway Bridge & Building Association and a former director of the Roadmasters and Maintenance of Way Association.

Association News

American Railway Engineering Association

Five committees have scheduled meetings to be held during June as follows: Buildings, June 25 and 26 at Boston, Mass.; Highways, June 17 and 18 in Room 1218, Association Headquarters, Chicago; Yards and Terminals, a two-day meeting including an inspection trip on June 28 and 29, Sheraton-Mt. Royal Hotel, Montreal, Que.; Economics of Railway Location and Operation, June 11, 12 and 13 at the Broadmoor Hotel, Colorado Springs, Colo.; Waterproofing, June 9 and 10, Engineering Building, Purdue University, Lafayette, Ind.

Mississippi Valley Maintenance-of-Way Club

The annual meeting of the club was held on May 10 at the De Soto Hotel, St. Louis. There were 307 members and guests present, which was a new high in

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 13-15, 1954, Conrad Hilton Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—I. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5

Railway Tie Association—Annual Meeting, October 20-22, Mayflower Hotel, Washington, D. C. Roy M. Edmonds, Secretary-Treasurer, 1221 Locust street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 13-15, 1954, Conrad Hilton Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas Secretary, 59 E. Van Buren street, Chicago 5.

attendance at meetings of this organization, now two years old. As of the date of the meeting the club had 691 members.

In the election of officers W. J. Hedley, assistant chief engineer, Wabash, was advanced from first vice-president to president; E. L. Anderson, chief engineer, St. Louis-San Francisco, was promoted from second vice-president to first vice-president; and J. L. Loida, chief engineer, Illinois Terminal, a director of the club, was elected second vice-president. New directors elected to serve two-year terms are R. G. Brichler, assistant chief engineer, Alton & Southern; W. H. Hobbs, chief engineer, Missouri Pacific; and F. L. Horn, track engineer, Terminal Railroad Association of St. Louis. Directors elected for one-year terms to fill vacancies on the Executive Committee are T. S. Carter, assistant chief engineer, Missouri-Kansas-Texas, and W. E. Gardner, principal assistant engineer, Wabash. P. E. Odom, special engineer, St. Louis-San Francisco, was re-elected secretary-treasurer.

Metropolitan Maintenance of Way Club

C. J. Code, assistant chief engineer—engineer of tests, of the Pennsylvania, delivered an illustrated talk on "Rail Web Failures" at the May 6 dinner meeting of the club, which was held at the Railroad Machinery Club, New York.

In the election of new officers for the ensuing club year, E. V. Grogan, supervisor of track, New York Central, was elected president to succeed Ralph I. Frame, supervisor of track, New York City Transit Authority; A. H. Whisler, assistant engineer, Pennsylvania, succeeds Mr. Grogan as first vice-president; and W. E. Kropp, supervisor of maintenance of way equipment, Lehigh Valley, succeeds Mr. Whisler as second vice-president. John S. Vreeland, vice-president, Simmons-Boardman Publishing Corporation, was re-elected secretary-treasurer.

Roadmasters and B&B Men Plan Annual Conventions

Much preliminary work has already been done in preparation for the annual meetings of the Roadmasters' and Maintenance of Way Asosciation and the American Railway Bridge and Building Association, which are to be held concurrently at the Conrad Hilton Hotel, Chicago, September 13-15. Six committees of the Roadmasters' Association and eight of the Bridge and Building group are well along in the preparation of reports to be presented at the meetings. All of the reports will deal with subjects of current interest to supervisory officers in the maintenance-of-way and structures department.

The Executive committees of both associations have scheduled meetings to be held in the near future, at which, among other business, semi-final plans for the conventions will be discussed. At these meetings it is also planned to review any of the committee reports that will have been completed.

The three-day annual conventions will consist primarily of business sessions at which the committee reports, as well as addresses on present-day problems, will be presented.

Northwest Maintenance of Way Club

The annual meeting of the club was held at the Midway Civic Club, St. Paul, Minn., on April 22, with 150 members and guests present. The principal speaker was H. B. Christianson, special engineer, Milwaukee Road, who described features of two retarder-classification yards that have been modernized on the Milwaukee in recent years, one at Chicago and the other at Milwaukee. Mr. Christianson was assisted by Lyle Shellenbarger, assistant engineer of the Milwaukee, and K. L. Clark, principal assistant engineer. A moving picture on the operation of the two yards was shown by R. H. Hultgren, sales manager, Union Switch & Signal Co.

In the election of officers H. R. Peterson, chief engineer, Northern Pacific, was advanced from first vice-president to president; J. M. Gustafson, bridge engineer, Minneapolis & St. Louis, was promoted from second vice-president to first vice-president; R. R. Manion, chief engineer, Great Northern, was elected

second vice-president; R. J. Moe, Electric Tamper & Equipment Co. was elected executive secretary, and L. C. Blanchard, roadmaster, Milwaukee Road, was re-elected secretary-treasurer. Directors elected for a two-year term are: W. R. Bjorkland, district engineer, Northern Pacific; W. D. Brooks, Fairmont Railway Motors, Inc.; and A. S. Krefting, assistant chief engineer, Soo Line.

Wood-Preservers' Association

The fiftieth annual meeting of the American Wood-Preservers' Association was held at Atlantic City, N. J., on April 26-28. P. D. Brentlinger, forester of the Pennsylvania, presided as president of the association. One of the features of the program was an address by S. R. Hursh, chief engineer of the Pennsylvania, who spoke on "The Future of the Wood Tie in Railroad Maintenance and the Contribution of the Tie Industry to Prolonging Its Life."

In the election of officers I. C. Miller, vice-president, T. J. Moss Tie Company, St. Louis, was advanced from first vice-president to president; B. D. Howe, chief tie and lumber inspector, Louisville & Nashville, Louisville, Ky., was elected first vice-president; and N. E. Kittell, Joslyn Manufacturing & Supply Co., Franklin Park, Ill., was advanced from director to second vice-president. Newly elected members of the Executive committee are G. Q. Lumsden, timber products engineer, Bell Telephone Laboratories, Murray Hill, N. J.; Paul Wayman, vice-president, American Lumber & Treating Co., Chicago; and W. W. Barger, inspecting chemist, treating plants department, Santa Fe, Chicago. W. A. Penrose was re-elected secretary-treasurer.

Supply Trade News

General

The **Wasco Supply Company,** Chicago, has taken over the manufacture and sales of the "Durable" line of bumping posts which were formerly produced by the **Albert Letterman Company.**

Koppers Company, Inc., has announced it has purchased substantially all stock of the **American Lumber & Treating Co.** Plants of AL&T, all of which utilize the pressure-treatment method of preserving wood with creosote or special salts, are located at Everett, Wash., Wauna, Ore., Wilmington, Calif., Crossett, Ark., Fordyce, Ark., Shreveport, La., Port Newark, N. J., Baltimore, Md., Florence, S. C., and Gainesville, Fla. No immediate changes are contemplated in the production or organization of the plants of AL&T. However, the headquarters organization will be integrated with the headquarters organization of the parent company at Pittsburgh. A number of patents and trade marks relating to wood treatment are being acquired including the "Wolman" and "Minalith" trademarks. The present policy in regard to licensing the use of these materials to other companies is to continue.

Personal

Thomas I. Moore, assistant western sales manager for the **Rail Joint Company,** has been promoted to western sales manager, with headquarters as before at Chicago, succeeding **Harry Hickey,** deceased.

H. A. Kern, president of the **National Aluminate Corporation,** has been elected chairman of the board of directors, and will serve in both capacities. **F. H. Thorne** has been elected senior vice-president, replacing **Wilson Evans,** who has retired but will continue to serve the Railroad Division in a consulting capacity. **J. L. Gibboney,** vice-president, becomes Mr. Evans' successor as head of the Railroad Division and director of export operations and foreign subsidiaries.

W. D. Lease, district representative and manager of research and development for the **Athey Products Corporation,** has been elected vice-president,

(*Continued on page 78*)

GREATER OUTPUT LOWER UPKEEP WITH NEW TORQUE CONVERTER DRIVE

New standards of tractor-shovel performance are being set by the famous 1½ yd. Model HM "PAYLOADER" because a NEW Torque Converter drive has been added to its many features. A year of extensive field-testing proves that this new development insures faster, lower-cost materials handling because output is increased up to 1/3 and maintenance is drastically reduced.

Combined with the 4-speed, full-reversing transmission, the Torque Converter provides an unlimited range of automatically selected speeds to meet the load and operating conditions. Parts breakage and maintenance are less because shock loads are absorbed.

Prove to yourself that this pioneer four-wheel-drive tractor-shovel, with torque converter, is the finest tractor-shovel available. Ask your "PAYLOADER" Distributor for a demonstration, or write The Frank G. Hough Co., 751 Sunnyside Ave., Libertyville, Illinois.

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MORE EFFICIENCY — Engine operates at most efficient speeds — no laboring or stalling

LOWER MAINTENANCE — Oil cushion absorbs load shocks—protects vital parts

EASIER OPERATION — Eliminates much gear-shifting and "clutching"

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Write for full details on the big 1½ yd. Model HM, or on any of the six smaller "PAYLOADERS" — 1⅛ yd., 1 yd., ¾ yd., ½ yd. or 12 cu. ft. sizes.

Supply Trade News (Cont'd)

sales. **R. W. Kling,** chief engineer, has been made vice-president, engineering, and **C. E. Matthews,** manager of the service and parts department, has been made vice-president, service and parts. **R. S. Hinds,** assistant secretary, has been appointed treasurer and assistant secretary, succeeding **George A. Anderson,** who has retired.

Charles J. Miller, assistant eastern manager for the **P&M Co.** at New York, has been appointed eastern manager,

C. J. Miller

succeeding **L. S. Walker,** who has retired. **D. M. Clarke,** sales engineer, has been appointed assistant eastern manager, succeeding Mr. Miller.

Mr. Miller was born at Dexter, Mo., and attended Arkansas State College where he graduated in 1938. Following his graduation he joined the International Shoe Company at St. Louis and served there until his entrance into the Air Force in 1940. After his discharge from

L. S. Walker

the service in 1945 he joined the P&M Co. at St. Louis and served there until he was appointed assistant eastern manager in January, 1948.

Mr. Walker was born in Woodstock, Va., November 21, 1888, and attended Virginia Polytechnic Institute. While in college he worked summers in the construction department of the Illinois Cen-

tral. Following his graduation he served in the maintenance of way departments of the Chesapeake & Ohio and Illinois Central until joining the P&M Co. at Chicago in 1913. In 1914 he was transferred to New York and served there until being appointed eastern manager in August, 1924.

Mr. Clarke was born at Philadelphia and received a civil engineering degree from Lehigh University in 1925. After service with the Pennsylvania where he rose to assistant supervisor track, he joined the Maintenance Equipment Company in 1930. In 1941 he

D. M. Clarke

joined the P&M Co. and served in sales work until he was promoted to sales engineer in 1946.

George V. Dutney, formerly manager for the **Johns-Manville Corporation** at New York, has been appointed special assistant to the president of the **Nordberg Manufacturing Company.**

A native of Pittsburgh, Pa., Mr. Dutney graduated from Cornell University in 1910 as a mechanical engineer. He

G. V. Dutney

was associated with the Jones & Laughlin Steel Company in various capacities until 1920 when he joined the Johns-Manville management staff at Pittsburgh. In 1929 he became partner in the Rankin-Dutney Corporation which handled Johns-Manville contract and warehouse activities. He rejoined the Johns-Manville staff in 1935.

Manufacturers' Literature

Following is a compilation of free literature, pamphlets, and data sheets offered by manufacturers to the railroad industry (and #13-14 as described in advertisements in this issue). Circle the number(s) on the coupon below to receive the information desired; the requests will be sent direct by the manufacturers.

1. JACKS. *The Duff-Norton Manufacturing Company.* 40-page 2-color "Duff-Norton Jack Manual" explains how to select the right jack, lists the various types of ratchet, screw and hydraulic jacks, and gives complete specifications for each; it explains how to use, care for, and maintain jacks; it contains many safety hints.

2. INDUSTRIAL ROOFING & SIDING. *Toledo Porcelain Enamel Products Co. Div. of Bettinger Corp.* 8-page brochure describes the use of V-Corr enamel-on-steel roofing and siding material, gives engineering data, advantages, composition, colors, and installation methods.

3. RETAINING WALLS. *Armco Drainage & Metal Products, Inc.* Folder RW-9153 "Lock Up Unruly Slopes Behind These Metal Walls" describes how metal bin-type retaining walls are used to confine earth and stabilize embankments along highways, railroads, streets and streams, with photos of typical erection and installation scenes.

4. TRACTORS. *Caterpillar Tractor Company.* Broadside (form #31041) completely describes with photographs and cutaways of the engine, transmission and clutch the new 150 hp Cat DW15 tractor; includes specification sheet, and brief specifications and ideas for properly matching the tractor with a scraper or wagon.

5. TRACTORS. *Caterpillar Tractor Company.* Booklet (form #31081) "The New Caterpillar D8 Tractor" describes, with eight 4-color photographs showing it at work in a variety of applications, the new Cat D8 tractor; includes vivid cutaway photo of newly developed oil clutch. (Available also in Spanish, Portuguese and French; if desired, *specify language.*)

6. LINER PLATES. *Armco Drainage & Metal Products, Inc.* 24-page manual (TL-7854) "Armco Liner Plate" contains data on joint tests, compression tests, strength and weight properties, gages, plate arrangement, and photographically shows many typical applications of liner plates.

7. HEAVY CONSTRUCTION EQUIPMENT. *Pettibone-Mulliken Corporation.* 44-page bulletin P200 "Pettibone Heavy Construction Equipment" describes, illustrates and gives specifications for the Pettibone line, showing the principal construction equipment and material handling products manufactured.

8. STANDBY ELECTRIC PLANTS. *D. W. Onan & Sons, Inc.* 18-page technical bulletin T-011-B "Stand-By Electric Generating Plants and 'Type AF and LT' Line Transfer Controls" covers the installation of emergency stand-by electric generating plants and automatic line transfer controls.

9. SCAFFOLDS. *The Patent Scaffolding Company, Inc.* 8-page Bulletin G-205R "Controlling Costs When Maintenance Goes Above Arm's Reach" is a guide to ladders and scaffolds for all plant maintenance operations, for jobs such as painting and cleaning, electrical work and equipment maintenance, and plant repair and maintenance.

10. HOSE COUPLING. *Titeflex, Inc.* 16-page booklet "Titeflex Quick-Seal Coupling" describes the construction, a quick connect-disconnect hose coupling for water, oil, steam, gas and chemical lines; also describes single- and double-check valve modifications, and coupling accessories; includes table of pressures, tables of materials and sizes, and a list of users.

11. HOSE COUPLING. *Le-Hi Div. Hose Accessories Company.* Catalog Bulletin #6500 describes and illustrates in detail the Le-Hi line of Quick-Lock hose couplings for various applications, and how they can be used in connection with the Le-Hi air valve line for safe control of compressed air.

12. MOTORPUMP. *Ingersoll-Rand Company.* Slidefilm presentation Booklet (Form 7123) "How To Select and Quote The Motorpump" gives a brief description of what a centrifugal pump is and how it works; it points out factors such as quantity, pressure, friction losses and head to be considered in pump selection; it presents a typical problem and solution.

13. RETAINING WALLS. *Permacrete Products Corporation.* Bulletin CY offered giving complete details on Permacrete Tri-Crib Units for retaining wall construction, as described in ad in this issue.

14. TRACTOR-SHOVEL. *The Frank G. Hough Company.* Complete details offered in booklet on the 1½ yard Model HM tractor-shovel with its new torque converter or on any of the six smaller Payloaders.

Reader Service Department **JUNE, 1954**
Railway Track and Structures
30 Church Street, New York 7, N. Y.

Please send me the literature circled below:

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Also, please send me product information on the following: (show company, product & page number) .....

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Stays out of the shop, stays on the job!

Le Roi-Transo TLF-150 Front-End Loader

YOUR first look at a Le Roi-Transo TLF-150 tells you it's got guts — guts aplenty! And Le Roi-Transo engineering is the reason.

Because of Le Roi-Transo engineering, your TLF-150 is seldom tied up in the shop. Because of Le Roi-Transo engineering, you load faster, travel faster, and dump faster — in sand, mud, snow, or rocky terrain.

Le Roi-Transo design assures you of less downtime these and other ways:

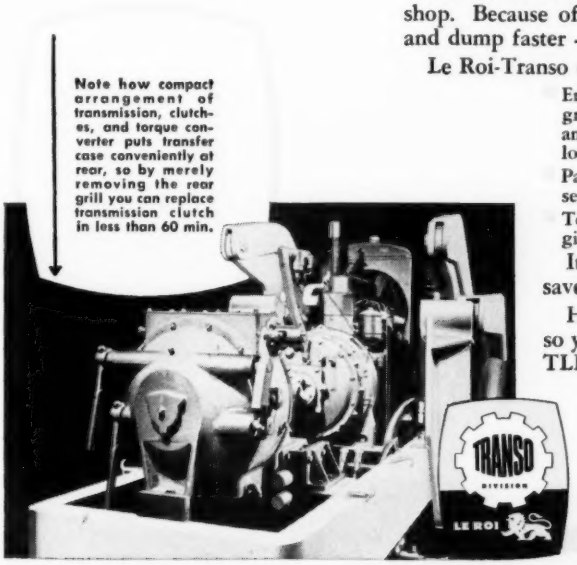
Engine, transmission, clutches, axle assembly, and torque converter are grouped compactly and are easy to get at. You save maintenance, time and labor. For example, it takes *less than an hour* to replace the spring-loaded clutch.

Patented "bucket-rocking action" helps you get a full bucket load within seconds, without tire-spin or undue strain on the loader.

Torque converter assures smooth flow of power to all four wheels — gives you sure-footed traction, reduces engine strain and tire wear.

It's design details like these that help Le Roi-Transo TLF-150 save important time and money for you.

Have your Le Roi-Transo distributor arrange a demonstration, so you can see *all* the reasons why it pays to use a Le Roi-Transo TLF-150 on your material-handling jobs. TD-15



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Advertisers IN THIS ISSUE

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When the Waterloo, Cedar Falls and Northern Railway, Waterloo, Iowa, bought a Caterpillar D6 Tractor with a Hystaway, it knew it had one unit that had to do a lot of important jobs.

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And, in addition, this versatile piece of equipment works on or off track with its track-walking shoes. These shoes are designed not to injure rails and bond wires.

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There's a Caterpillar Dealer near you who understands off-track maintenance problems. Ask him for a demonstration of the dependable equipment that will do your job quicker and more economically.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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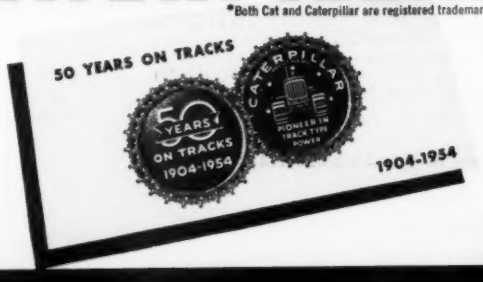

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A Texaco representative will gladly give you full details. Just call the nearest Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta. Or write The Texas Company, *Railway Sales Department,* 135 East 42nd Street, New York 17, N. Y.

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